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UNIVERSITY OF ALBERTA

GENDER AND THE PERCEIVED VALUE OF TREES ON HOMESITES IN ZIMBABWE

BY

© LESLIE C. WATSON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

RURAL SOCIOLOGY

DEPARTMENT OF RURAL ECONOMY

EDMONTON, ALBERTA

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E.C. Murray, supervisor

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DATE: June 3/94

Abstract

This sociologically based study was part of a five year IDRC funded project, The Value of Trees. In particular, this study looked at the planting and maintenance of tree seedings at the homesite as an indication of valuation by farmers in the Nyahunure Ward, Mutoko Communal Area, Zimbabwe. In addition, analysis was carried out to determine the gender differences, if any, with respect to the planting and maintenance behaviour in female and male-headed households.

This study used both quantitative and qualitative research methodologies. The data were gathered using structured interviews, supplemented by in-depth open-ended interviews and focus groups. The statistical analysis was done using SPSS.

The results show that trees are being planted and cared for in both female and male-headed households. A total of 77% of the households in the sample had planted trees at the homesite. Generally these trees tended to be exotic, multipurpose, and fruit-bearing. Both female- and male-headed households felt it was important to plant trees. However, there were differences between the two types of households in who made decisions regarding planting and using homesite trees, and who actually planted and cared for trees.

In the majority of cases in both female- and male-headed households, it was the men who decided to plant trees. Men also tended to do the tree planting and fencing in both types of households. Women played a more active role in the watering and weeding of trees, doing the bulk of that work in female-headed households, and sharing these tasks with men in male-headed households. The activities and decision making involved with selling the fruit was dominated by the household head regardless of gender.

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CHAPTER I

INTRODUCTION

While research on women's roles in forestry is becoming more common (FAO, 1987, 1989; Fortmann, 1986; Fortmann and Bruce, 1988; Fortmann and Rocheleau, 1985; Hoskins, 1979, 1982; Wachiira, 1987), there are still considerable gaps in the knowledge pertaining to the specific nature and implications of women's involvement in forestry. In particular, the role of women in the planting and nurturing of tree seedlings in home compounds is rarely mentioned in the literature. If one attempts to narrow the focus to women in female-headed households, such as widows or divorcees, and their tree planting habits, the literature is virtually non-existent. With widows constituting as much as 25% of the adult female population in many African societies (Potash, 1986) this is a serious research oversight. It is insufficient to consider all women as homogenous with respect to agroforestry if, in reality, they have different values and attitudes toward planting trees and tree use and if they have different resources available to them. The objective of this study, then, was to determine if rural Zimbabwean female-headed households, be they widows, divorcees, or women with absentee husbands, had different values and available resources with respect to planting and caring for tree seedlings in home compounds than male-headed households.

Agroforestry

Agroforestry is considered to be a sound and promising strategy to address some of the world's land-use problems. Agroforestry systems are many and varied, as are their functions, roles and outputs. Agroforestry systems vary from region to region as they are based on the social, economic and environmental factors of each community. Agroforestry is frequently proposed to address land degradation, as well as shortages of food, medicines, fuelwood, cash income, animal fodder and building materials. In reality, agroforestry is only one option for improving land use in any given situation. In addition to the many tangible benefits that may be gained through agroforestry, individuals may plant an array of tree species for amenity or aesthetic purposes, or spiritual uses.

There are at least 15 types of agroforestry practices known to be currently employed in Africa. These practices range from alley cropping and contour vegetation strips, to living fences and trees around houses and in public places. In this study the focus was on trees and shrubs around the home.

In the research area, trees and shrubs found on the home compounds generally proved to be multiple use trees. Trees and shrubs provided shelter from the wind and the sun, formed living fences, and supplied fruit and wood for the household. While trees and shrubs in home compounds may not be considered agroforestry in the strictest use of the word, if one considers agroforestry as an approach to land use rather than limiting the term to trees in association with cropping systems, animals and/or pasture, then trees grown around homes and the products from those trees are as important to rural people as if they were grown alongside crops or in pastures. Tree planting at the homesite was considered to be a form of agroforestry for the purposes of this study.

Zimbabwe recently experienced a serious drought, and while trees were still being planted, it was considered to be prudent to study tree planting activities where seedling survival rates are likely to be the highest. Rocheleau, Weber, and Field-Juma (1988:206) state, "in rural areas of dryland Africa, trees are consistently better managed and survive better in home compounds, where they can be protected, watered and harvested with ease, than anywhere else in the landscape." Campbell, Vermeulen, and Lynam (1991) explain that fruit and shade trees are being planted around the homes in the communal areas of Zimbabwe. Assuming that women would be the primary planters and caretakers of tree seedlings on home compounds was one of the reasons that this study focused on gender differences with respect to valuation of trees.

While the introduction of trees around homes and into home gardens does not directly result in more hectares reforested, greater numbers of people are likely to benefit more over the short term from trees planted in their home compound than from large-scale tree planting projects. In addition, trees planted in home compounds and gardens provide an opportunity for people to become familiar with new species, and with new uses and management practices for well known species. Such processes may result in people reassessing their values regarding trees. This knowledge, experience, and increased appreciation may then carry over to larger scale agroforestry systems in cropland, pastures, and community forests, making them more successful (Rocheleau, Weber, and Field-Juma, 1988).

Women and Agroforestry

Interest in women's participation in agroforestry is relatively new. In 1979, Marilyn Hoskins wrote a programming guide for USAID entitled "Women in Forestry for Local Community Development." Hoskin's paper was the first major attempt to synthesize ideas on ways to include women in community agroforestry projects. Other articles on this topic were rare, limited to the odd paragraph or sentence mentioning women and trees. In recent years there has been an increased awareness regarding women and their roles in forestry. This has been prompted, in part, by the requirement of many donor agencies that women be an integral part of a development project before funding is provided.

There used to be parallel assumptions that either only men were producers and users of trees, or that what applied to men applied equally to women. Because of these assumptions, women were excluded from agriculture and forestry extension for years. The reality is that women have been involved in tree utilization for centuries. However, women do not have the same access to forests, trees, and tree products as men.

By tradition, women are important participants in both the agriculture and forestry components of agroforestry production. Yet, women are frequently ignored in the big picture of agroforestry research and programming, as well as in project implementation. This is illustrated strikingly by a 1980 study of 43 World Bank forestry projects which found that only eight projects specifically referred to women (Fortmann and Rocheleau, 1985). A more recent example is the Tropical Forestry Action Plan (TFAP), initiated in 1985 by the World Bank, the UNDP, the World Resources Institute, and the FAO, which underestimated the potential role of women in the agroforestry process (Lewis, 1990). This is an especially disheartening example when one considers that the year the TFAP was initiated was the final year of the United Nation's Decade for Women.

Fortmann and Rocheleau (1985) suggest that women's involvement in agroforestry has been overlooked in part because of four commonly held myths about the roles and status of women. These are:

Myth 1: Women are housewives and are not heavily involved in agriculture production.

Myth 2: Women are not significantly involved in tree production and use.

Myth 3: Every woman has a husband or is part of a male-headed household.

Myth 4: Women are not influential or active in public affairs.

There is a growing body of literature that now dispels myths one, two and three, and addresses myth four. It is myth number three that was looked at in more detail in this study. What are the consequences to agroforestry activities when a woman is not part of a male headed household? Are there any differences in access to resources with respect to planting seedlings? Are there differences in time and money spent on planting and nurturing tree seedlings? Do men and women both plant trees? Are there gender differences in the care of trees? Do female-headed and male-headed households value trees, and the planting of trees equally, and if not, what accounts for the difference in valuation?

Much rural research is biased in favour of certain categories of people: rural elites; males; and people who are present and active in the community. This overlooks poorer people, women, and those who are sick, old and migrant (Abel et al., 1989; Chambers, 1983). Most agroforestry development has either been directed at target groups of farm owners and managers that fit the favoured research categories, or at whole communities. These approaches often overlook the less visible people in communities such as widows and divorcees. According to a 1988 FAO report, the extension service in Zimbabwe does not discriminate between male and female farmers. Zimbabwe has been successful in working with women's groups and women receive information they may need for their farming activities through such groups (FAO, 1988).

Purpose

The purpose of this study was to contribute to an understanding of the relationship between the head of household and their planting and nurturing of tree seedlings, and in turn gain a better understanding of Zimbabwean household's valuation of trees. The following questions were asked with this objective in mind:

1. Do female-headed and male-headed households place the same value on the planting and maintenance of tree seedlings in home compounds?
2. Do female-headed and male-headed households have the same access to resources (time, land, labour, credit, extension) to support planting and maintaining tree seedlings in home compounds?
3. What activities are undertaken to plant and nurture tree seedlings in home compounds? How much time do these activities take?
4. What are the costs involved with planting and sustaining tree seedlings in home compounds?
5. Are perceptions of constraints and opportunities associated with tree seedlings different between female-headed and male-headed households?
6. Does the process that female-headed and male-headed households go through to gain and secure access to resources necessary for the planting and maintenance of tree seedlings differ?
7. If there are differences between female-headed and male-headed households with respect to the valuation of trees, and the planting and maintenance of tree seedlings in home compounds, what are the implications for further research and extension requirements in agroforestry interventions?

Significance of the Study

This study was designed to yield both practical and theoretical benefits. As part of a larger, five year project funded by IDRC, Value of Trees (Alberta/Zimbabwe), this study will contribute to the formation of a detailed data base that should be of interest to the policy and decision makers in the Forestry Commission and in the Agricultural Extension Services in Zimbabwe. Administrators, planners, and extension staff involved in agriculture, tree nurseries, and reforestation in Zimbabwe should find the results of this study of practical use. By incorporating the findings into project planning and implementation, such agencies will hopefully see an increase in the number of farm households which plant tree seedlings on their home compounds and eventually elsewhere on their farms. An added benefit could be an increased survival rate of the seedlings that are planted and higher productivity of the trees once they become mature.

This study is also important because the World Bank and the Government of Zimbabwe have put US$10.8 million into the Rural Afforestation Project between 1983 to 1988 (Kerkhof, 1990) and other tree planting projects have also been funded in Zimbabwe since independence. However, little research has been done to examine the relationship between the head of household and the planting and care of tree seedlings. Assuming that women are the primary planters and caretakers of tree seedlings, it is important to understand their valuation of tree seedlings and trees to ensure that this funding is being applied to derive the greatest planting and survival rate of tree seedlings. It is hoped that this study will provide relevant information for both the Zimbabwean government and non-governmental organizations (NGOs) participating in tree planting activities.

CHAPTER II

LITERATURE REVIEW

Background

This study was conducted to determine if there were gender based differences in tree planting and maintenance on homesites in Communal Areas in Zimbabwe. Zimbabwe is a country emerging from colonialism. Agriculture practised in the Communal Areas, and land tenure are in large part a reflection of historical developments under colonialism. Gender roles also were modified as a result of that system. This review of literature examines these factors as background for this study.

Agriculture

Subsistence agriculture on small plots of land has been the way of life for the vast majority of African people in Zimbabwe. Colonial settlers appropriated most of the fertile land in Zimbabwe in the early 1900s, displacing the existing population to peripheral, subsistence Native Reserves. This land tended to be in the poorest agricultural regions. In 1923, when the colonial state was established, it removed the rights of Africans to purchase or occupy land outside the Native Reserves (Loewenson, 1992).

A number of agricultural and natural resource policies were established to exert control over the rural population in the Native Reserves over the following decades. There was widespread resistance against such policies, and practices such as mountain top and riverbank cultivation continued despite the Acts passed to prevent them. The

Native Land Husbandry Act of 1951 was to consolidate land into areas for farming, grazing and villages. Livestock limits were also set. There was such resentment towards the Land Husbandry Act that rural chiefs and headmen refused to enforce such policies and eventually the Act failed.

Agricultural practices became polarized into European and African agriculture. European large scale farmers were heavily subsidized by the government. They were trained through government programs and educational institutes, had a wide range of extension facilities at their disposal and, if they were attempting to establish a new farm, Land Bank loans were available to assist them. On the other hand, agriculture practised in the Native Reserves was virtually ignored by the government and little assistance was provided to improve the farming techniques in these areas. Farmers in the Native Reserves, due to population pressures and the poor quality of their land, were forced to overcrop and had insufficient fallow time to allow fields to rejuvenate.

The majority of rural inhabitants now live in the Communal Areas (formerly known as 'Tribal Trust Lands' and prior to that as 'Native Reserves'). Most of this land is of poor quality and many of the plots are small (Cousins, Weiner & Amin, 1992) with the exception of the new resettlement areas where land used to belong to large commercial farmers and was apportioned to African Zimbabweans after independence. Three quarters of all Communal Areas lie in areas where droughts are frequent and where even normal levels of rainfall are inadequate for intensive crop production (Palmer & Birch, 1992).

Since independence, the Zimbabwean government has tried to redress the racial and economic imbalances which existed during colonial rule. There has been a concerted effort to provide extension services to enhance the skills, knowledge and productive capabilities of African farmers in Zimbabwe (Mtetwa, 1992). More important, the issue of land redistribution -- a rallying cry during the war of national liberation -- has allowed more than 2.5 million hectares of land from the commercial farms to be resettled by farmers from the communal lands and the landless (Cousins, Weiner & Amin, 1992; Loewenson, 1992). However, as population pressures continue to increase, the demands for natural resources in the Communal Areas intensify and struggles around land allocation practices in Zimbabwe become more urgent.

Gender

In pre-colonial days, Shona women had a defined place in Zimbabwe's development: they were active in politics and in agricultural production. Traditional Shona society was and is patrilineal and patrilocal with polygamy practised. The men of a village belonged to the same lineage, while women, due to virilocality and exogamy, came from different villages and lineages. At the time, lineage was very important for the Shona, for in the lineage mode of production, the household is both the unit of production and the unit of consumption. Access to the means of production was regulated by seniority (Jacobs, 1984). Women were valued both for the labour they provided and for the children they produced, which ensured a continual labour supply.

While men were engaged primarily in hunting, raising cattle, and clearing new fields, women did most of the agricultural work and thus produced the majority of the food. In addition, women were responsible for child-rearing, food preparation, and the other domestic chores. As well as her considerable power within the domestic sphere, a woman's status due to her bridewealth (lobola in Shona), gave her the right to claim protection from her family and her in-laws if she was badly treated, divorced or widowed (Weinrich, 1979; Weiss, 1986). In exchange, a woman was expected to labour for her husband and in-laws rather than her own lineage and all the couple's children belonged to the husband's patrilineage (Schmidt, 1990).

Property rights among the Shona were complex. While all household members had a right to share in the communal property, the male head of the household administered all the property. Weinrich (1979) explains the property rights of women during pre-colonial times, overtones of which still exist in rural areas:

> ... there were minor items of property over which he had no control, such as the yields of groundnuts and beans grown by his wife, or the income from the pots she made or the rewards given to her if she acted as a midwife. Older women also received at the marriages of each of their daughters, 'a cow of motherhood' from their sons-in-law, and these beasts and any offspring remained their own personal property over which their husbands had no control. Hence as they grew older, women could become property owners in their own right. But as persons they always remained dependent on their husbands, or rather on their husband's families, for the latter had paid bridewealth for them, and this bridewealth had transferred rights over their labour and over their child-bearing power to their husband's families. (Weinrich:14-15)

Women's position in Zimbabwean society became less secure during the time of colonial rule (1890-1980). A migrant labour system evolved to meet the labour demands of the colonial settlers and women had to take on sole responsibility for all domestic and economic activities while men left the household unit to earn wages. "It was nearly always the male labourers that were wanted. The white man's perception of African women was even lower than the one he had of his own women" (Weiss, 1986). Women could not depend on receiving any of the money that the men earned, but men would often bring part of their earnings back to their homes when they made the regular visits that ensured their right to retire in the village.

Although women had taken on many of the responsibilities previously held by men, it did not raise their status in the new economic order. Legally, women had no right to make important decisions, they were supposed to wait until their husbands returned or consult their in-laws, but in reality such restrictions became relaxed over time (Schmidt, 1990).

During colonial times a cash economy emerged which had many effects on women. Credit was only available to men, not to women. Cash, instead of cows, became more commonly used in marriage transactions (Schmidt, 1990; Weinrich, 1979). This change in method of payment of bridewealth lead to a reduction in the status of a woman and removed her right to exercise authority within her family. The family's responsibility in cases of bad treatment, divorce, and widowhood also became weaker.

Zimbabwe gained its independence from British rule in 1980 and Zimbabwean women were instrumental in the war of independence. The Mutoko area was an area of heavy fighting with freedom fighters coming across from Mozambique and using the mountains in the East of Mutoko as staging areas. People in the Mutoko Communal Areas were forcibly placed in internment camps during the day, often with their homes being burnt to encourage them to remain in the camps. By joining in the struggle for freedom from colonial rule, women forced the issue of women's liberation; extensive literature exists which follows Zimbabwean women's struggle for emancipation (Muchena, 1984; Staunton, 1990; Weinrich, 1979; Weiss, 1986). Female freedom fighters had high expectations for the status of women in a free Zimbabwe: no sexual discrimination; equal access to education and jobs; and equal pay for equal work (Weinrich, 1979). Since independence, women are still the principle agricultural labourers, food providers and care givers in rural Zimbabwe. However, women continue to face serious obstacles, in particular the old-fashioned traditions that hinder their quest for equality.

In 1981, the Ministry of Community Development and Women's Affairs was established. Its objectives included overcoming traditions that hindered women by reviewing sexually discriminatory laws; helping to pass legislation to guarantee equality between the sexes; and generally advancing the cause of women in all aspects of their lives (Muchena, 1984). To this end, Zimbabwean women were granted the status of 'adults' in the eyes of the legal system in 1982 through the passing of the Legal Age of Majority Act. This allowed African women over the age of 18 to own land, obtain credit, and open bank accounts. This Act also allowed for the ensuing legislative change in 1985, the Matrimonial Causes Act, which permitted women to benefit from a share of the couple's property upon divorce.

Law is the basis for equality; however, the practise and interpretation of the law and/or customary law is crucial to what actually occurs, particularly in rural areas and especially as they affect women's land tenure rights. Under the new legal system all primary courts apply only customary law. Proceedings in the primary courts are simpler, less expensive, and more informal than in the magistrates' courts and upper courts. Not surprisingly, women, because of their low socio-economic status, generally use the primary courts. Hence, while women could enjoy more rights under the general law, women's financial restrictions force them to have their rights determined by customary law which is often prejudiced against them (Stewart et al., 1990).

Women are divided in their views on the tradition of the bridewealth. Some women are against the bridewealth as they feel it makes them possessions of their husbands, possessions that can be abused or viewed simply as labourers. Others believe that they are participating in a culturally significant tradition and feel assured of their value to their husbands and fathers if a bridewealth has been paid (Weiss, 1986).

There is limited material on divorcees and widows in Shona society. Much of the literature available was written prior to legislative changes such as the Legal Age of Majority Act and the Matrimonial Causes Act which so radically affected the status of Zimbabwean women, on paper if not in reality.

Traditionally, a woman only gained status by bearing children and being the mother and grandmother of many children. Indeed, this is reflected in women's names, for after the birth of her first child, the woman is called by the name of that child. Divorce was rare among the Shona except in cases of barrenness. If a wife did not become pregnant her position was insecure and she could be sent back to her own family and the bridewealth returned. Women, particularly those in rural areas, are generally economically dependent on their husbands and so cannot afford to leave them. Women were (and are) likely to lose access to fields allocated to them if divorced or if, as widows, they did not marry their husband's successor (Jacobs, 1984). Shona widows were expected to live with their husband's brothers. Generally they continued cultivating the fields they had worked until then and their own children and in-laws cared for them when they became too old to work. Traditionally,

> at a man's death all his property went to his kinsmen. His widow could only retain a few minor items which she had acquired as rewards in restricted fields, such as midwifery, herbalism or pottery, and her "cows of motherhood." (Weinrich:119)

During the liberation war many women were widowed. In 1984, Jacobs (1984) suggested that between four and eleven percent of rural households were landless and that a high proportion of these households were headed by widows or divorced women who had lost access to land of any kind.

Labour

The adoption of social forestry, and especially the innovations associated with agroforestry, creates changes in labour patterns. Labour requirements are always a factor for rural people deciding whether to adopt a new practice (Hoskins, 1987). Farmers tend to use the labour of most household members at various times of the year for different tasks. When farmers are already fully occupied at peak labour seasons, additional labour for planting or caring for trees is considered to be more costly than such demands during a slow agricultural season. Even though the adoption of social forestry practices can provide increased benefits, the additional labour demands can be a disincentive to the adoption of the practice (Nair, 1990). In densely populated areas where labour is in abundant supply, such as in the Communal Areas in Zimbabwe, there are distinct labour peaks that coincide with the seasons during which the main crops are sown and harvested. Social forestry can help to spread the use of labour supplied by members of a farming household more evenly throughout the year.

Traditionally in Shona society labour was roughly divided with women working in the fields and men handling most of the other areas of production. This division of labour was not rigid and was based mainly on the need for men to guard against crop failure by being involved in hunting, or herding livestock (Beach, 1980). Today, with continuing male migration to the cities and growth centres in search of work, women's workloads have increased as they take on tasks previously done by men, such as clearing and ploughing the land.

During the agricultural season in Mutoko, the majority of households need extra labour to assist in agricultural activities (Goveaerts, 1987). Goveaerts found in his 1985 survey that male-headed households hired more labour than female-headed households. De facto female heads of households who received remittances from their husbands hired labour but tended to spend less money hiring the labour than male heads.

When possible, farmers supplement their subsistence farming through various income generating activities. In the Mutoko communal area, Goveaerts (1987) reports that total average yearly income was split fairly evenly between on- and off-farm activities. In this 1985 survey, 57% of households reported earned income from casual labour, 40% of households earned income from garden produce sales, 33% of households received remittances from absent household members, 30% of households reported earning money from crop sales, and 21% earned income from fruit sales. Scoones (1990), Lue-Mbizvo (1991) and others also discuss income generating activities in rural Zimbabwe. Lue-Mbizvo (1991) examines small-scale bread, brick and beer industries in four rural areas, one of which is the Mutoko Communal Area. With brick making groups, the majority of members were men. Construction is typically considered to be men's work. Similarly, the physical requirements to move the large logs required as fuel to bake the bricks could limit women's access to this type of work. With respect to labour and time allocation issues for brick making, Lue-Mbizvo's study found that while brick makers worked full days, five days a week, brick making did not tend to interfere with agricultural labour requirements. Bricks are made during the dry season when farmers are least busy in the fields.

Unlike brick making, beer brewing is dominated by women and is one of the widely practised traditional ways to earn income. Help is enlisted from males in collecting firewood when the beer is initial cooked, but the majority of the work is done by women. Beer brewing can take place at any time of the year and is spread over seven days, thereby allowing women time to carry out regular agricultural and home activities (Lue-Mbizvo, 1991).

Firewood is an essential requirement to produce the finished product whether it be beer, bricks or bread. Both bricks and bread need to be baked, while beer needs to be brought to a boil and simmered. In Lue-Mbizvo's study (1991) firewood was listed as a constraint for all three of these income generating activities and tree planting was suggested as a possible way to alleviate the problem.

Land Tenure

Historically, land was allocated by the chiefs through the village leaders. This changed with colonialism, when land allocation was vested jointly with District Councils and chiefs. Stewart et al. explain that the legal system in Zimbabwe both in pre- and post-independence is,

> characterized by legal dualism, that is, the co-existence of customary law, or the 'law of the indigenous people of Zimbabwe or any section or community thereof,' side by side with the general law of Zimbabwe, or 'the common law of Zimbabwe and any enactment'. (Stewart et al.:167)

After independence the Communal Lands Bill gave the District Council the power to allocate land holdings. This responsibility is frequently delegated to the Village Development Committee (VIDCO), comprised of elected village residents, or to chiefs/headmen, assuming there is still land to allocate. Farmers do not have title deeds for their holding. Individuals who have held the land for a long period and/or have made improvements may assume that they have title to the land, but legally, since there is no provision of individual ownership in communal lands, they do not have title.

Land in the Mutoko Communal Area is held through customary tenure, which means that it is held communally. But with few exceptions, only adult married males are entitled to be allocated land. Male household heads are allocated land for three main purposes: the homestead on which a house is built and a small amount of rain-fed maize grown; dry fields where most rain-fed crops are grown; and gardens in wetland areas (dambos) where crops can be grown throughout the year. Dry fields are customarily allocated first, generally to young couples within two years of marriage. While land allocation is a community decision, once allocated, activities on gardens are controlled by individual households (Bell and Hotchkiss, 1991).

Upon the death of the male household head, the land is inherited by the sons and subdivided accordingly. Customary tenure ensures land use since any land that is not being used is reallocated to those who need and can use it. (Govaerts, 1987; Maboreke, 1990; Stewart et al., 1990).

Although much has been written about land resettlement since independence, there is little literature available on what effect resettlement has had on land tenure in the Communal Areas. Jacobs (1984) indicates that communal areas were largely ignored after independence, with no plans forthcoming for restructuring. Women's dissatisfaction with their continued lack of rights over lands remains. Jacobs (1984) discusses a 1982 report carried out by Muchena for UNICEF where,

> ninety-nine per cent of women as well as many men wanted the past land tenure system abandoned or modified. Women commonly described men's behaviour in controlling land and women's labour on it in emotive language calling them 'exploiters' or 'bloodsuckers'. (Jacobs 1984:42)

Such comments indicate that customary land tenure practices are resented for the way they discriminate against women.

Land tenure is one of the key issues that prevent women and men from planting trees. Because trees grow slowly, few farmers are prepared to plant them unless they are sure they will be allowed to enjoy the benefits. Farmers need secure tenure to land and to trees. While tenure is often a problem for men, it is even more so for women, particularly divorced and widowed women. Women's lack of land tenure does not appear to have an adverse effect on agricultural production in Zimbabwe (Chimedza, 1988).

Rights over land are often distinct from rights over trees (Fortmann, 1985). Tree tenure issues include the right to own or inherit trees, the right to plant trees, the right to use trees and tree products, and the right to dispose of tree products (Fortmann, 1988; Fortmann and Nabane, 1992b). These various rights differ widely across cultural zones and have a major influence on the acceptability of social and agroforestry projects. In places such as Nigeria, where planting a tree may give the planter rights over the land on which it is planted (Meek, 1970), people with temporary claims to land may not be able to adopt social forestry practices.

Tree Planting and Uses

Turning to the planting of trees and their use, women are identified because of their traditional role as collectors of fuelwood. Studies have shown that men only occasionally collect wood and then it is for commercial rather than domestic purposes and usually involves using transport (Chavangi 1991; Kelkar and Nathan, 1991). Fuelwood is of central importance to women, partly because collecting and using it take up a significant proportion of a womans day. Yet women are not strongly represented in traditional male-dominated forestry circles in Zimbabwe. Thus, although they have often been identified as the ultimate beneficiaries of forestry development projects, they have neither been consulted, nor given the opportunity to participate in planning, management and implementation of projects supposedly designed for their benefit.

Planting

Most women are well aware of the benefits of trees. What varies is their attitude toward growing them. A survey of agroforestry projects in Africa by Kerkhof (1990) found that farmers are already growing a substantial number of trees. Farmers may plant a different array of species for amenity or aesthetic purposes, fruits, fodder or spiritual uses, fuel, fencing, or construction, depending on their tree planting objectives. Providing farmers with information and seedlings or even just seeds has generally been able to bring about significant increases in tree growing.

In Zimbabwe, farmers have traditionally left certain species of indigenous trees in their fields (Campbell, 1987; Fortmann and Nabane, 1992a; Grundy et al., 1993). The majority of households in the communal areas are planting trees. Du Toit et al.

(1984) report that 61% of households had planted a tree or trees, while Grundy et al. (1993) found 74% of households planting trees. Fortmann and Nabane (1992a) found 82% of households planting trees with even the poorest households planting at the homesite. The figures for Mutoko are the highest, with 90% of households having planted exotic trees (Price, 1994). Most of the trees that have been planted are exotic due to their higher marketability compared to indigenous species.

What causes households to plant trees? Fortmann and Nabane (1992a) found that wealth affected planting, with wealthier households planting more exotic trees than poorer households. Price (1994) found a slight difference between households when wealth was considered; wealthier households planted more citrus and papaw trees at their homesites than did poorer households. However, these findings contradict those of Campbell, Vermeulen & Lynam (1991) and Du Toit et al. (1984), who saw no relationship between tree planting and wealth.

McGregor (1991) found that the longer a household had resided at its homesite, the more likely it was to have planted a living fence. However, these findings are disputed by other research in Zimbabwe (Campbell, Vermeulen & Lynam, 1991; Du Toit et al., 1984; Price, 1994) which found no correlation between tree planting and length of residency. Price did, however, find a different composition of trees for households established for 10 years or more compared to those established for less than 10 years.

The absence or presence of a male as head of household did not appear to affect tree planting (Du Toit et al, 1984), even though men tend to plant trees more than women (Fortmann and Nabane, 1992b; Fortmann and Rocheleau, 1985). In Mutoko, widows and divorcees had fewer exotic trees than male-headed households, especially large exotic trees (Price, 1994).

No literature was found that addresses the issue of tree maintenance at homesites in Zimbabwe. However, there was information on how to plant trees with crops with respect to spacing and depth to achieve the full benefits of intercropping (Nair, 1989).

Uses

Trees provide products that farmers can use for themselves as well as for generating income. For southern countries the most important forest product is fuelwood. More than 80% of all the wood harvested in southern countries is burned for fuel. FAO estimated that more than 2 billion people were dependent on fuelwood (FAO, 1985). However, if people do not feel there is a shortage of firewood they will not be motivated to plant such trees. Firewood species, by themselves, rarely provide sufficient incentive for people to plant trees. Farmers are much more interested in multipurpose trees that will provide a source of construction wood, poles, fruit, fodder, or other products, in addition to fuelwood (Kerkhof, 1990).

Trees may provide food, shelter, energy, medicine, cash income, raw materials for crafts, as well as savings and investments and resources to meet social obligations. Trees can also provide a variety of tangible and intangible services, such as improving soil fertility for crop production, and the microclimate for crop growth, and controlling crop pests. Trees also provide shade, aesthetic beauty, and spiritual purposes (Gregerson, Draper and Elz, 1989; Nair, 1989). In addition, the quality of natural resources such as soil, water, vegetation, and wildlife can often be protected and improved when trees are planted.

Tree planting will be carried out by a variety of land users who often have different priorities and therefore use the same tree products in different ways. Some of the benefits that can be realized by incorporating trees into a farming system are illustrated in Figure II.1.

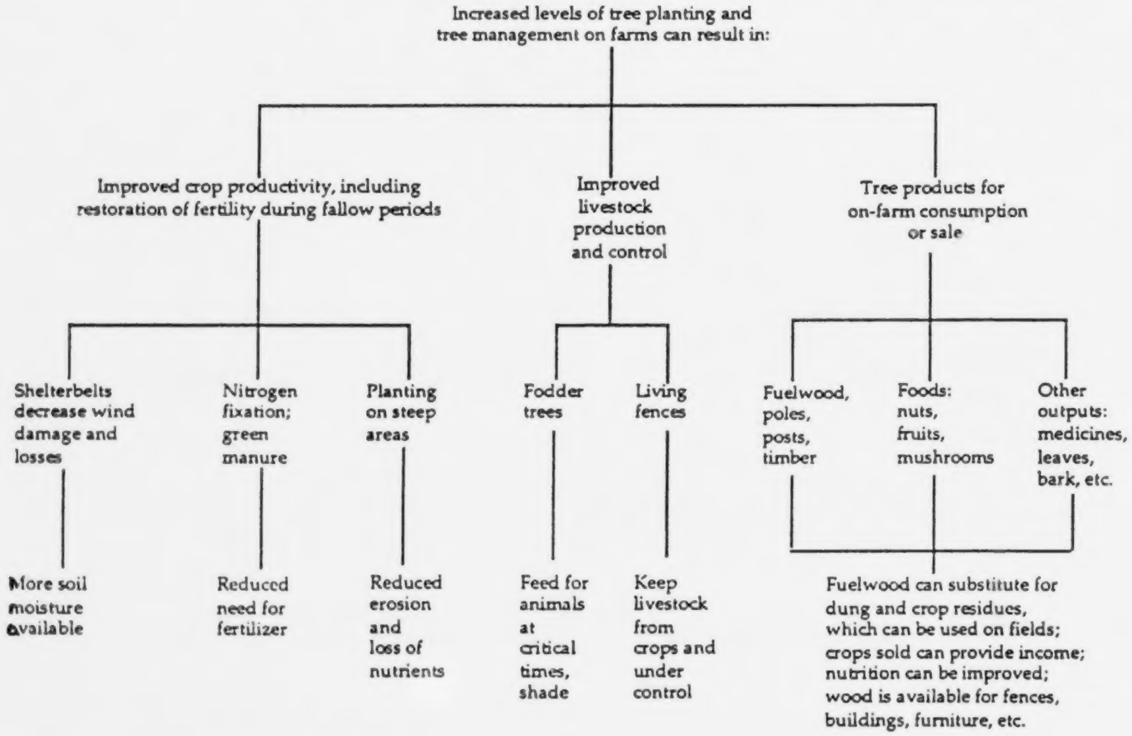

Increased levels of tree planting and tree management on farms can result in:
Improved crop productivity, including restoration of fertility during fallow periods
Improved livestock production and control
Tree products for on-farm consumption or sale
Shelterbelts decrease wind damage and losses
Nitrogen fixation; green manure
Planting on steep areas
Fodder trees
Living fences
Fuelwood, poles, posts, timber
Foods: nuts, fruits, mushrooms
Other outputs: medicines, leaves, bark, etc.
More soil moisture available
Reduced need for fertilizer
Reduced erosion and loss of nutrients
Feed for animals at critical times, shade
Keep livestock from crops and under control
Fuelwood can substitute for dung and crop residues, which can be used on fields; crops sold can provide income; nutrition can be improved; wood is available for fences, buildings, furniture, etc.

Figure II.1 On-Farm Benefits from Trees in the Farming System

(Gregerson, Draper and Elz, 1989)

There tends to be the assumption that men's and women's interests in trees are the same and that men's commitment to agroforestry means that women are equally committed, but this is not always the case. Women often make use tree products differently and use different types and parts of trees than men. Hoskins (1979) and Rocheleau (1985) have contrasted the interests of men and women in forest resources. Fortmann and Nabane (1992b) review the differences in tree use on both individually and communally controlled land. Men tend to favour tree products for commercial sale and for use further from home. Women collect fuelwood, fodder, food, medicines, and similar type products primarily for use in the home.

Overall, women tend to have a more detailed knowledge of trees and their uses. Hoskins (1979) found in Sierra Leone that women could list 31 products which were harvested or produced in nearby bushes and trees whereas men could only list eight. It is not surprising then to find that mens' and womens' species preferences in agroforestry programs often conflict (Khaleque, 1987).

Summary

Based on this literature a few key points regarding valuation of tree seedlings can be identified. Human behaviour reflects values. If farmers value trees and the many uses of trees, then their behaviour when it comes to planting and maintaining tree seedlings should reflect this valuation. Trees have a number of diverse uses which add to their value. However, men and women have varying priorities and certain tree uses may be more valuable to women than to men. Valuation may even vary among women depending on whether they are in female- or male-headed households. It is important to note that tree planting behaviour will be constrained by the perceived valuation of trees. Property rights, or lack thereof, may strongly influence the valuation process. If households do not perceive any direct benefit to themselves by planting and nurturing tree seedlings, they will be unlikely to undertake these activities. Moreover, if households, especially women within the households, lose access to the trees they plant and the byproducts of these trees upon death of their husband or upon divorce, the tenuous nature of the benefits gained by planting trees may reduce valuation.

This concludes the review of the available literature pertaining to valuation of trees in rural Zimbabwe. Based on this literature, operational definitions were developed.

Operational Definitions

Social Forestry

Social forestry is a relatively new term and has only been a topic of serious inquiry by foresters and rural developers for the last 20 years. The term "social forestry" first appeared in Gujarat in the mid-1960s and has a number of definitions (Westoby, 1989; Gregersen, Draper and Elz, 1989). Westoby discusses the lack of a clear and agreed upon meaning of social forestry. He proposes as a definition: "tree planting and management, at the farm, village or community level, by or for small farmers and landless (Westoby:202)" stressing that this definition emphasises who benefits.

The terms "social forestry" and "agroforestry" both have overtones which imply a concept developed by outsiders rather than an indigenous age-old practice, which it is. The practice of resource management is certainly not new to farmers in Zimbabwe. Despite pressures by agricultural extension agents and foresters towards monoculture production, many subsistence farmers have persisted in incorporating trees into their agricultural practices, and modifying these practices in relation to changing resources and demands. This is exemplified by farmers in Zimbabwe resisting agricultural extension services directives of bush clearing and orders to cut down wild fruit trees from fields (Campbell, Vermeulen & Lynam, 1991).

While woody perennials grown in home compounds may not be considered agroforestry by some, the focus in this study is on the approach that Zimbabwean households have taken to grow trees in their home compounds. It is the household's approach to land use and how female-headed and male-headed households manage tree seedlings that is of interest. Therefore, the combination of people and trees is the important common theme that links this research topic and social forestry.

Tree Planting Behaviour

Tree planting behaviour is what people do individually and collectively, in order to establish and/or maintain trees. It includes the specific steps that are taken and why; for example, asking a relative about a particular species, or going to a district agriculturalist/forester for information or seedlings, or going to a nursery to obtain seedlings, or protecting wild seedlings. There may be patterns in this behaviour as people may go back and forth between resources or use several simultaneously.

Tree Planting Decision Making

This is the process of deciding on a course of action related to establishing or maintaining trees. Such decision making includes factors and/or people that influence the decision and reasons, both explicit and implicit.

Household

Scoones (1990) explains that the concept of a household eating from the same pot does not hold in Zimbabwe. This proved to be true in the research area as well. Households are not necessarily consumption units, nor production units, especially in polygamous families.

In this study, a household was a group of people living within the same residential space which is nominally 'owned' by a senior person. Households usually contain people related by blood or ritual, such as marriage, that are called families or kin. People who are not members of the immediate family may also live in a household. Within this residential space there may be more than one kitchen or granaries, especially in the case of polygamous families. Households can therefore vary in size from one person to more than 20 people.

Valuation

Human behaviour is governed by personal and societal values. Just what these values are is often difficult to determine, although opinions are often verbal expressions of values (Rokeach, 1968). The concept of value which determines valuation is abstract and varies depending on the context in which it is used and the perspective of the person doing the valuation. For the purpose of this study the following definitions of value apply. Kluckhohn (1962) describes a value as,

> ... a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means and ends of action. (Kluckhohn:395)

On the other hand, Rokeach (1968) considers a value to be "... a type of belief, centrally located within one's total belief system, about how one ought or ought not to behave, or about some end-state of existence worth or not worth attaining. (Rokeach:124)" Finally, Williams (1968) suggests that,

> ... all values contain some cognitive elements, that they have a selective or directional quality, and that they involve some affective component. Values serve as criteria for selection in action. When most explicit and fully conceptualized, values become criteria for judgement, preference, and choice. When implicit and unreflective, values nevertheless perform as if they constituted grounds for decisions in behaviour. (Williams:284)

Trees have an existence value that comes from the non-market benefits they produce; i.e., aesthetic beauty, shade, spiritual, contribution to soil fertility, reduction in wind erosion. Trees also have use values for the commodities produced from their bio-mass. Examples of goods produced from trees that have use value are such items as fuelwood, wood for construction purposes, fruit, and fodder. Items with use-values may be used for social reproduction. Some tree products also have an exchange value, either through bartering or trading of use-value products while other items produced have a market value and are sold for cash.

An individuals' valuation of trees will take the above values gained from trees and weigh them against the costs of having those trees to arrive at total tree value. Many variables must be taken into account in this valuation process.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to examine rural Zimbabwean's valuation of trees as exhibited by the planting and maintenance of tree seedlings on their homesteads, taking into account the presence or absence of a male as the head of the household. The original intent of the study had been that a qualitative, grounded theory approach would be taken. However, after a number of months in Zimbabwe, it was decided that the cultural and language differences made such an approach inadequate for six months of field work. Therefore, after three-and-a-half months in Zimbabwe, the study added a quantitative approach, an interview, and that became the main method of research. The qualitative data were used in the formation of the questionnaire and to supplement the quantitative data collected in this study.

Selection of the Study Area

The area in which this research was conducted was in the Mutoko Communal Area (CA), one of four proposed geographical research areas for the IDRC Value of Trees Project. After exploring a number of Wards in Mutoko, consulting with COOPIBO, a Belgian NGO that is working in the Mutoko Communal Area, and discussions with the Zimbabwe Ministry of Natural Resources and Tourism personnel, the Nyahunure Ward was selected as the study area.

This Ward was selected because, unlike other Wards in Mutoko Communal Area, little scientific research had been carried out there. As well, COOPIBO had been successful in getting tree nursery groups (TNG) established and it was thought that the research would be more meaningful carried out in an area that had an AGRITEX officer and residents who were committed to growing trees.

Nyahunure Ward is composed of six Village Development Committees (VIDCOS): Chipfiko; Mujari; Nyapfura; Muyawa; Zvidozvevanhu; and Manyange. Using the townsite of Mushimbo as a base, in-depth interviews were conducted in the four VIDCOS closest to the Mushimbo townsite: Chipfiko; Mujari; Nyapfura; and Muyawa. Finally, Nyapfura VIDCO was selected as the site where the study would be conducted. Nyapfura's four villages were relatively homogeneous and in close proximity to each other and it was here that the interview schedules were administered.

General Description of the Study Area

Mutoko Communal Area is in Mashonaland East Province, the northeastern part of Zimbabwe as shown in Figure III.1. According to 1992 census data, the province of Mashonaland East has a population of 1,033,336, or 10% of the total Zimbabwean population. The province covers an area of 32,230 square kilometres with a population density of 32.06 persons per square kilometre and a sex ratio of 92.5 men per 100 women (Zimbabwe Census, 1993).

The town of Mutoko is the main business centre of Mashonaland East and is located 140 km north east of Harare along a paved road. It is 25 km from the Mushimbo townsite. Roads in the area are limited, but generally of good quality.

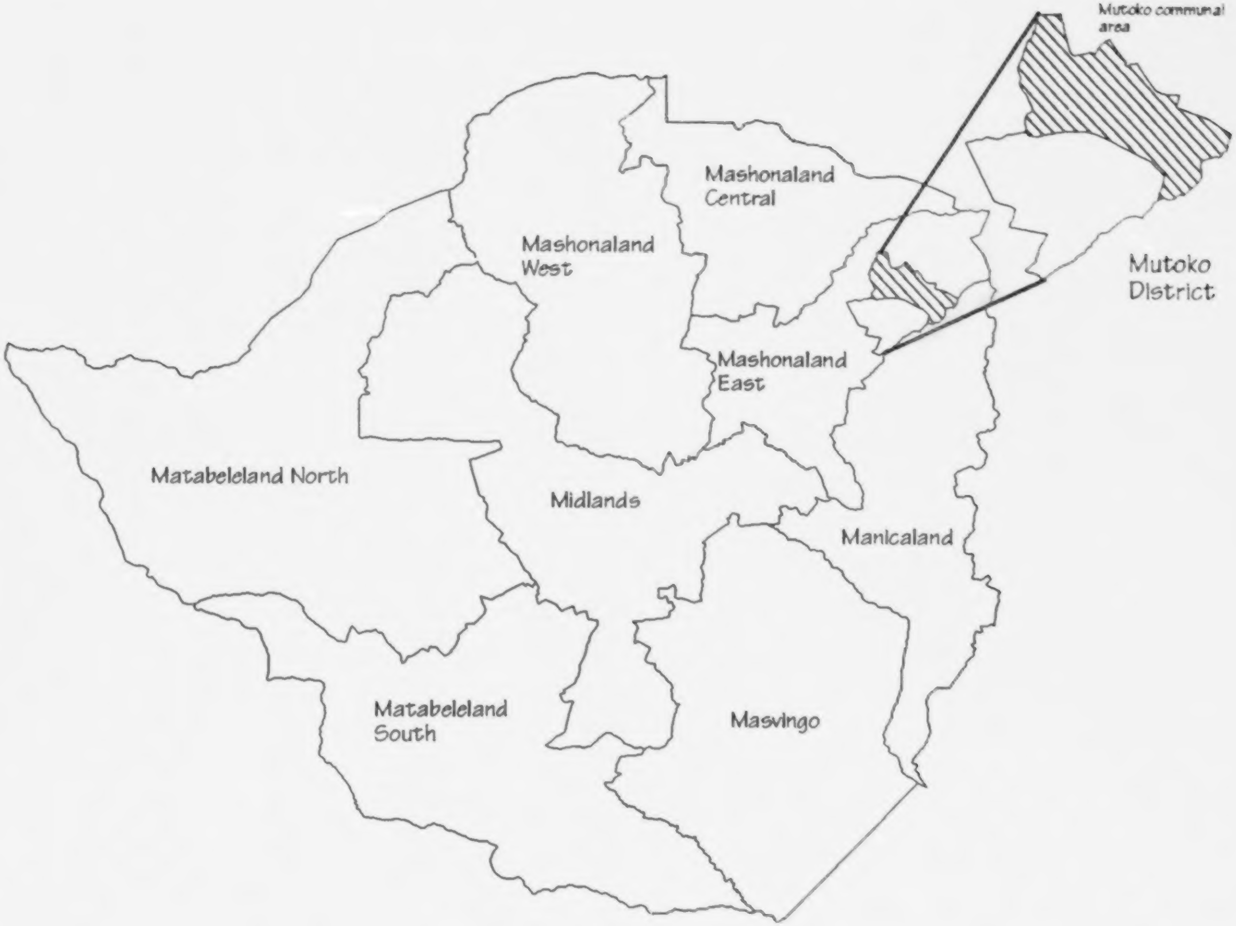

Mutoko communal area
Mashonaland Central
Mashonaland West
Mutoko District
Mashonaland East
Matabeleland North
Midlands
Manicaland
Matabeleland South
Masvingo

FIGURE III.1

MAP OF ZIMBABWE WITH LOCATION OF MUTOKO DISTRICT AND COMMUNAL AREA

Nyahunure Ward is located in the district of Mutoko as illustrated in Figure III.2. Nyahunure Ward is 10,915 ha and the Mushimbo townsite is located approximately in the middle of the Ward (personal communication, AGRITEX, 1993). The 1992 national census reports that the total population for Nyahunure was 6,202 with 3,463 females and 2,739 males, a sex ratio of 79 men per 100 women. The sex ratio for Nyahunure Ward is lower than the sex ratio for the country due to the number of men that leave the rural areas to work in the cities or mines. The total number of households is listed at 1,287 with the average household comprised of 4.8 people. The average household size in Nyahunure Ward equals the national average household size (Zimbabwe Census, 1993).

Nyapfura VIDCO is the smallest VIDCO in the Ward at 637.5 ha (personal communication, AGRITEX, 1993). A bus generally travels the 25 km from Mushimbo to Mutoko and continues on to Harare, every morning of the week and returns every night. A health clinic, an AGRITEX office, a cattle dip, and a primary and a secondary school are the government buildings in the area. Fighting during the liberation war was quite heavy in the Mutoko area and government buildings were targets of destruction. As a result, all these buildings are post-independence structures. The townsite also includes a number of shops and bottle stores in addition to the grinding mill. At the time of this study, there were two phones in the townsite, but electricity was not yet available in the Ward, other than the generator that powered the grinding mill.

Nyahunure Ward is dominated by dramatic granite hills which comprise approximately one-fourth of the watershed area (Andreini et al., 1992). Mutoko CA is a frost free area with a mean annual temperature of 22 C, allowing vegetables to be

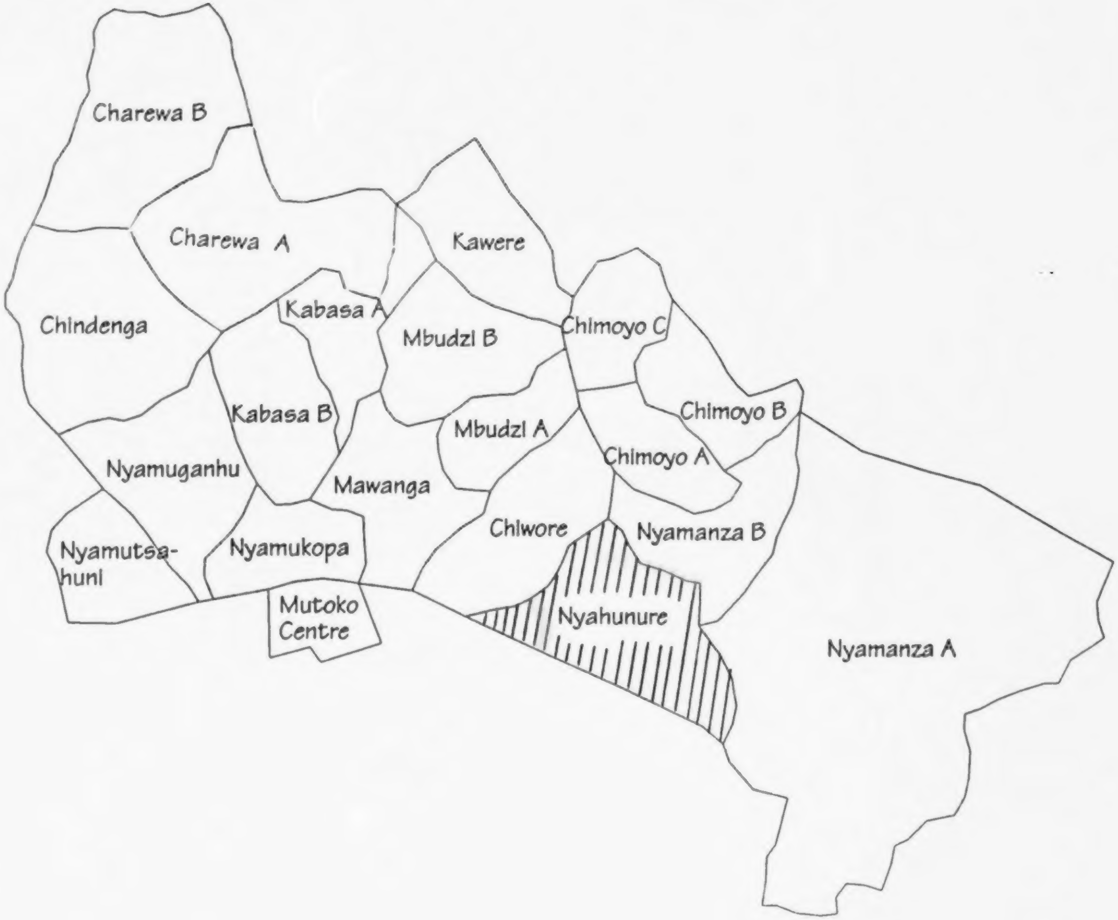

Charewa B
Charewa A
Kawere
Chindenga
Kabasa A
Mbudzi B
Chimoyo C
Kabasa B
Chimoyo B
Mbudzi A
Chimoyo A
Nyamuganhu
Mawanga
Chiwore
Nyamutsa-
huni
Nyamukopa
Nyamanza B
Mutoko
Centre
Nyahunure
Nyamanza A

FIGURE III.2

MAP OF MUTOKO COMMUNAL AREA WITH ADMINISTRATIVE WARDS grown year round. The Mutoko area is classified as Natural Region 4, which is deemed to be a semi-extensive farming region with low rainfall (450-650 mm) and subject to seasonal droughts (Zimbabwe Map, 1984). However, rainfall data from Mushimbo Agritex office shows the rainfall to be closer to 700 mm in the research site.

Soils in the area tend to be determined by their location on the cantina. On the upper part of the cantina, soils are drier and sandier, while downhill are found the wetter, more fertile soils. Most of the district is underlain by granite rock with soils ranging from shallow to moderately deep. The soils have low water holding capacity and fertility due to their low clay and silt contents (Zimbabwe Ministry of Lands, Resettlement and Rural Development, 1982).

Much of the indigenous woodland has been cleared away in Nyahunure Ward. Households tend to have three distinct land holdings: homesite; field(s); and garden. The lower part of the cantina where water is discharged is reserved exclusively for cultivating gardens and for some grazing. Water is channelled through gardens through hand-dug trenches and stored in shallow 'wells'. Some of the water makes its way into small intermittent streams which flow into the Nyaunyuri River. Homesites and fields are located on the mid- and upper-cantina where it is dryer and there are few large areas of indigenous woodland left. The granite outcrops are not cultivated. However, shallow topsoil often found on the hills and "mountains" formed by these outcrops supports indigenous trees which are important sources of wood for buildings and for firewood.

Agriculture is the main economic activity of the people in this area. Landholdings range in size from 0.2 - 9 ha in the Mutoko CA, with a mean and mode of 2.5 ha (Govaerts, 1987). Farming is generally subsistence with the main food crops grown being maize, sorghum, rice, sunflowers, millet, groundnuts, tomatoes, cucumbers, squash and beans. Surplus grain is sold through the government operated Grain Marketing Board (GMB). Sales of fruit, especially mangoes, were an important source of income. Surplus fruit was often sold through the Agricultural Development Authority (ADA).

With regard to livestock, the most common were cattle, goats and chickens. Cattle in the Mutoko CA were predominantly the indigenous Mashona-type (Carter, 1992). Records from the Veterinary Services at the Mushimbo cattle dip show that as of March 19, 1993, 527 owners brought a total of 2,448 cattle to use the Mushimbo dip. Less common in the area were pigs, donkeys, rabbits, and pigeons. Cattle, goats, and donkeys had access to common grazing areas, sometimes roaming freely. At other times, depending on the presence of crops in the fields, they were closely watched by herders.

Selection of the Sample

All of the households in the four villages in Nyapfura VIDCO became the sampling frame for this study. All four villages were considered to be relatively homogeneous with respect to culture, agricultural resources and activities, soil and climatic conditions, distance from the road and township, and access to indigenous woodlands. The most recent record of households in the VIDCO, at the time the study was initiated, was provided by the Ward Counsellor. These records, dated October 1992, listed 174 households in Nyapfura VIDCO. Of those, 137 were eligible for the food-for-work program, as they did not have a husband working and sending money home. An additional 23 households were also eligible for food-for-work as the household members were very old.

This list was considered inadequate for the purposes of this study due to the incentive to inflate the number of households reported when food distribution is based on the household unit. To verify the number of households in Nyapfura VIDCO, an up-to-date list of all inhabited households, including the household head and total number of household members, was compiled by the researcher through a mini-census. A total of 151 households were recorded; 93 were female-headed and 58 were male-headed.

The results of the mini census that formed the sampling frame for the interview schedule is listed in Table III.1. In all, there were 218 adult women, 115 adult men, and 484 children under the age of 18 present in the VIDCO when the mini-census was conducted.

TABLE III.1

FEMALE AND MALE-HEADED HOUSEHOLDS IN NYAPFURA VIDCO
(June 18 and 19, 1993)

VILLAGE	NUMBER OF HOUSEHOLDS		
	FEMALE-HEADED N=93	MALE-HEADED N=58	TOTAL N=151
Gumbeze	36	15	51
Mudiwakure	18	13	31
Kazingizi I	14	16	31
Kazingizi II	25	14	38

The census recorded the number of people who had slept in the household during the past week. The head of the household was identified by the people in the household, and was defined as a permanent resident in the village. Female-headed households included women who had never married, widows, divorcees, separated women, and women whose husbands worked and lived away from the village or de facto household heads.

Systematic sampling was initially used to determine the size of the sample. A household was randomly chosen from the total census population and then every fourth household was selected to be interviewed. As the field work progressed, it became apparent that purposive and quota sampling would be more appropriate to the study so that a more equal number of female and male-headed households in each village would be interviewed. Also, as the research population was only 151 households, this allowed for more than a quarter of the households to be included in the sample. In all, 67 of the 151 households, or 44% of the household population completed the interview schedule.

Moving to a purposive sampling means that sampling errors and biases cannot be determined for the study. While the findings of this study can be used to suggest certain conclusions, the data differ from the assumptions of statistical testing procedures (Miller, 1991); consequently the results of statistical testing should be interpreted with caution.

Interviews were carried out with individuals 18 years or older who lived in the household and were available and willing to answer the questions. For some households this meant that one person completed an interview schedule; in other households, six members completed interview schedules. A seasonal consideration that affected interviewing was that beer brewing and consumption were at a high for the VIDCO; this, along with the mobile nature of some members of the sample, resulted in not all adult members of some households being interviewed.

Development of the Interview Schedule

The research in the study is primarily descriptive in nature. As the more qualitative in-depth interviews did not appear to suggest any patterns in tree valuation on homesites or differences in tree valuation between female-headed and male-headed households, it was thought that using an interview schedule would make it easier to confirm or reject an absence of correlation among households.

Lack of a common language between the researcher and the Nyapfura farmers presented more of a problem than anticipated. While a translator was able to translate the in-depth questions and the answers provided, the nuances of the conversations were lost to the researcher. The differences in culture also increased the likelihood of misinterpreting conversations and observations. It was thought that these handicaps might be minimized by moving to a more quantitative approach through the use of a interview schedule.

The questions asked in the interview schedule were developed, in part, based on the findings of the in-depth questioning and observations of the researcher in the first three-and-one-half months of field work. The early participant observation and conversations had been guided by relevant literature on agroforestry, gender, and African farming and forestry. The in-depth interviews used mainly open-ended questions. The information gleaned from these interviews led to many of the questions used in the survey. Therefore, closed-ended questions with a limited number of open-ended questions were selected so that interviews could be conducted without taking up too much of the respondents' time. See Appendix 2 for a sample interview schedule.

The first set of questions were focused on general household socio-economic issues. The questions were assumed to be relatively easy and non-threatening for the respondent. However, the second question, which asked the respondents' age, proved to be quite distressing for older respondents who had no idea how old they were.

The second set of questions concentrated on the tree growing experiences of the individual and the household. Next, respondents were asked to rank the various ways in which they personally used trees. They were given 10 cards, each of which showed a different use of trees, and asked to place the cards in the order of most to least important. Examples of four of the cards can be seen in Appendix 3. Finally, the last set of questions focused on the actual trees planted in the homesite -- their maintenance and their use. If the interview took place at the homesite, this section of the interview usually involved actually walking up to the trees in question.

Pretesting of the interview schedule was done in the village of Kazingizi II. Feedback from the pretest, as well as from the research translator and a visiting Fullbright professor, Dr. Gordon Matzki, was taken into consideration before the interview schedule was finalized. Because of his previous experience with questionnaires in the U.S.A. and his research in northern Zimbabwe with cattle owners and other Centre for Applied Social Sciences (CASS) projects, Dr. Matzki was able to make many helpful comments. Time already spent by the researcher in the field doing in-depth interviews meant that modifications after the pretest were minimal. Modifications included eliminating a number of questions to reduce the time of the interview, and changing the order of some of the questions so that the interview flowed better.

Data Collection

Data collection in this study involved in-depth interviews, interview schedules, and participant observation. In-depth interviews and participant observations were conducted in four of the six VIDCOs in the Ward. Interview schedules were conducted in all four villages of the Nyapfura VIDCO.

The role of the translator was important in this study. Only one translator was hired and had to meet the following qualifications: female; living in Nyahunure Ward, preferably in Nyapfura VIDCO; completed her education; have at least a Form One education; be able to walk long distances; be sociable; speak and write English; fluent in the local Shona dialect; knowledgeable about trees and local farming practices; get along with the researcher. A translator who met all these qualifications was hired after three days of interviews during which the top six candidates each assisted in a separate interview with a tree nursery group.

Training of the translator involved explaining the purpose of the research thoroughly so that explanations could be given by the translator while both on and off duty. The questionnaire was reviewed in detail, question by question. The importance of phrasing questions exactly as they were stated in the questionnaire, the problems of leading questions, and the necessity of translating the respondents' exact words were stressed both before interviews started and throughout the interview period. Discussions with the translator about in-depth interviews meant that when interview schedules were carried out, the translator could probe when a respondent had not fully understood a question. This increased both the response rate and the quality of the answers.

Interview schedules were conducted by the researcher and the translator. Generally the translator conducted the interview in Shona, using the questionnaire and translating the responses and any additional questions the researcher posed to the respondent. If respondents preferred, the researcher would ask all questions in English and they would then respond in English, sometimes slipping into Shona when convenient.

Conducting face-to-face interviews allowed the researcher to explain the purpose of the study to each respondent and ask more in-depth questions if the situation warranted. Such a situation also allowed illiterate respondents to participate without having to read or write any information and to seek clarification if they were unsure of what a question meant. Consent was obtained from all respondents who participated in in-depth interviews, focus groups, and answered questionnaires. The researcher was able to explain that the purpose of the research was to learn from them and that their time and privacy would be respected.

When possible, interviews took place at the homesite so the homesite trees could be seen and commented on. As it was not always possible to conduct interviews at the homesite, a number of farmers were questioned while in their gardens. This allowed the researcher to access more respondents. The researcher was able to help with weeding and various other home and garden tasks while respondents answered questions. The respondents appeared to appreciate this.

Integrating the researcher in the community was also an important aspect of this study. The researcher lived intermittently in the township of Mutoko over the six months spent in Zimbabwe. A room in the clinic was arranged for lodgings so that the researcher was not seen to be affiliated with any one family in the Ward and was accessible to farmers who might want to make contact with the researcher. At the beginning of the entry into the research site there were many opportunities to introduce the researcher and explain the research to groups of residents in the Ward. Introductions were made by the local AGRITEX officer, COOPIBO project manager, and Ward counsellor and all may have contributed to the positive way in which the researcher was accepted into the Ward. In addition, the researcher was invited to and attended community events such as church services, weddings, and elections that allowed fuller integration into the community.

By living in the Nyahunure Ward for an extended period of time, taking the bus, walking, not driving around the Ward, helping respondents with food preparation and gardening, and eating local food, the researcher attempted to blend into the surroundings so that day-to-day activities could be observed and a more accurate impression of the study site gathered. While the researcher would have always been seen as an outsider, she seemed to be accepted by the people in the Ward and was allowed into the homes, gardens, fields, and meeting areas of the community.

Data Analysis

Interview schedules were coded and entered into SPSS Windows, a statistical package used to analyze the closed ended and short answer questions. The first stage of analysis involved determining the frequency and percentages of responses for each question. The second stage of analysis relied on Chi-square to study the relationships between gender and certain independent variables. The third stage of analysis also used chi-square but to examine the relationships between independent variables.

Long answer questions from both the in-depth interviews and other conversations also form an important part of the data. Observations and comments from respondents are used to illustrate research findings.

Answers given to questions asked in in-depth interviews and in the interview schedules did not always agree with the actions that were observed during the research period. There is always the issue with interviews and questionnaires of whether respondents are giving the answers that they think are expected or whether they are being truthful. When discussing the questionnaire results in Chapter IV, the presence of conflicting observations are noted. Focus groups helped sort out some of the questions raised by conflicting answers, or conflicting actions and words. The Ward counsellor, the Agritex officer, and the COOPIBO Mutoko manager acted as key informants and confirmed some of the research findings. In general, it is believed that the data collected was both reliable and valid.

CHAPTER IV

RESULTS

The purpose of this study was to analyze the perceived value of trees around homesites in rural Zimbabwe. To this end, both qualitative and quantitative data were gathered from the people in the Nyahunure Ward. In the first part of this chapter, respondents' socio-economic characteristics are reported. The second part deals with attitudes towards trees. Lastly, data on tree use and maintenance behaviour are recorded. The general format for the results will be quantitative findings followed by those of a qualitative nature.

Characteristics of Respondents

Descriptive statistics for the respondents' socio-economic characteristics are given below. Frequencies and cross tabulations by gender are also presented. No statistical analysis was done at the village level as the initial field work indicated no significant differences between villages.

Attempts were made to interview the heads of the selected households and all residents of the household 18 years or older, to a maximum of six interviews per household. All those interviewed had lived at the homesite for a minimum of one year. It was not possible to interview all household heads for reasons discussed later in this section. Household members interviewed were female and male, young and old, long-time residents and newly arrived residents. Early field work suggested that different members in the household used and valued trees in different ways. Therefore, diverse family members were interviewed to provide a cross-section of insights about the situation and valuation of trees, regardless of a respondent's position in the family hierarchy.

Female and Male Household Heads

Nyapfura VIDCO had a population which consisted of 93 female-headed households and 58 male-headed households for a total of 151 households. The sample population was composed of 36 female-headed households and 31 male-headed households. Attempts were made to interview more female household heads. However, near the end of the survey period, harvest was finished and some of the women had gone to join their husbands who were living away from Mushimbo. Other women were away for extended periods of time caring for children or family members who were ill, so it was not possible to interview as many households as initially expected.

Although members of 67 households were interviewed, six heads of those households were not interviewed. In three cases the recorded head of household said they were too old to answer questions, while in the remaining three cases the heads were away from the homesite and garden when the researcher was present. In these six households, interviews were conducted with other household members.

Table IV.1 shows that de facto female household heads (married women whose husbands lived and worked in town or elsewhere) comprised 36% of the women in the sample. De jure female household heads (widows and divorcees) comprised 23% of the women in the sample. In total, female household heads comprised 59% of the women in the sample. This is slightly higher than the Fortmann and Nabane (1992a) sample of 18% for Mhondoro, and the Cousin (1992) figure of 17.5% for Chamatamba.

TABLE IV.1

HEADS OF HOUSEHOLDS AND OTHERS INTERVIEWED

HEADS OF HOUSEHOLD	FREQUENCY N=61	% OF SAMPLE POPULATION	% OF HHLDS
Male-headed household	25	20.3	41.0
Female, widow	13	10.6	21.3
Female, divorced	1	0.8	1.6
Female, husband away	22	17.9	36.1
FAMILY POSITIONS OF OTHER RESPONDENTS			
First or only wife	29	23.6	
Second wife	2	1.6	
Daughter - single	3	2.4	
- married	2	1.6	
- widowed	2	1.6	
- divorced	3	2.4	
Daughter-in-law	2	1.6	
Son	14	11.4	
Other	5	4.1	

While there had been an expectation of finding more divorced household heads, divorced women tended to join existing households and deferred to fathers or brothers as household heads. This could be due to the way household was defined for the purpose of this study -- a group of people in the same vicinity who share food on a regular basis.

Size of Household

The household size in the sample population ranged from two households of only one person to six households with 14 persons. The most common size household, 19.5% of the population, contained four people. The mean number in a household was 7 people. The median was 6 people with a standard deviation of 3.2.

While the maximum number of respondents interviewed in one household was six, generally only one person was interviewed per household. Of all the households interviewed, 48% were represented by a single interview.

Age and Gender

During initial in-depth interviews and pretesting it was noted that many of the people interviewed did not know their age. In fact, this question caused some anxiety among respondents who said that they "want to get the questions right." As a result, age categories were used instead of specific years of age to make it easier for respondents to answer the question.

The ages of the sample population ranged from 18-65+ years. No one less than 18 years of age was interviewed. The majority of both the women and men interviewed were in the 26-45 year age category. There was fairly equal representation between the genders for all age categories. It was not possible to calculate a mean age for the sample population.

Table IV.2 shows the age distribution by gender. The distribution of the sample population did not reflect the outmigration of males that was expected based on the review of literature.

TABLE IV.2

AGE AND EDUCATION OF RESPONDENTS

RESPONDENT CHARACTERISTICS	FEMALE N=83		MALE N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
AGE:						
<25	16	19.3	9	22.5	25	20.3
26-45	34	41.0	15	37.5	49	39.8
46-65	20	24.1	10	25.0	30	24.4
>65	13	15.7	6	15.0	19	15.4
YEARS OF EDUCATION:						
0	28	33.7	8	20.0	36	29.3
1	4	4.8			4	3.3
2	4	4.8	3	7.5	7	5.7
3	6	7.2	6	15.0	12	9.8
4	9	10.8	2	5.0	11	8.9
5	4	4.8	2	5.0	6	4.9
6	8	9.6	1	2.5	9	7.3
7	12	14.5	5	12.5	17	13.8
8			3	7.5	3	2.4
9	3	3.6	1	2.5	4	3.3
>9	5	6.0	9	22.5	14	11.4
	Mean: 3.6 yrs		Mean: 5.2 yrs			

Education

Mushimbo had a preschool, primary & secondary school. These were the only primary and secondary schools in the ward. Each VIDCO had a preschool that operated intermittently.

The average number of years of education of respondents was slightly greater than four years, with a standard deviation of 3.5. As shown in Table IV.2, the level of education between female and male respondents differed significantly, the Pearson chi square being significant at 0.01828. Women were more likely to have had no formal education (34% of women), while only 20% of the male respondents had no education. Significantly more men than women had completed nine or more years of education (25% men compared to 10% women). Outmigration of educated females and males may be reflected in these findings, as those with higher educations have increased opportunities for finding work outside of Mushimbo.

Year of Arrival to Homesite

The modal time of arrival of the sample population in this area was between 1971 and 1981. Over 50% of the males had been born in the VIDCO or had lived there for more than 40 years, compared to only 12% of women. This difference was statistically significant, (Pearson chi square p=0.00056, Spearman correlation p=0.00025). The majority of the women had arrived at the homesite between 1971 and 1990, reflecting the pattern of women moving to join a husband in his village after marriage.

The year of arrival to the homesite for both females and males is presented in Table IV.3.

TABLE IV.3

YEAR OF ARRIVAL TO HOMESITE BY GENDER

YEAR OF ARRIVAL	FEMALE N=83		MALE N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
Born here	7	8.4	17	42.5	24	19.5
1900-1950	3	3.6	3	7.5	6	4.9
1951-1960	8	9.6	2	5.0	10	8.1
1961-1970	11	13.3	3	7.5	14	11.4
1971-1980	21	25.3	8	10.0	29	23.6
1981-1990	23	27.7	3	7.5	26	21.1
1991-present	9	10.8	4	10.0	13	10.6
Don't know	1	1.2			1	0.8

Landholdings

Landholdings consist of three component parts: the homesite, the field or fields, and the garden. These three landholdings were not contiguous in the Nyahunure Ward. Respondents were asked to estimate the size of the various pieces of their landholdings. The responses had to be accepted without verification as the researcher had no means of accurately measuring the area. Some respondents indicated they were not sure of the size of their land; others answered this question with confidence. However, it must be noted that often there were wide divergences between the estimate of land size between members of the same household. As well, the researcher noted that what appeared to the untrained eye to be similar sized pieces of land were often perceived to be of different sizes by the land owner. Therefore, these findings should be interpreted with caution.

The means and medians for the three types of landholdings are shown in Table IV.4. Means and medians calculations for the homesite, garden, and field did not include those cases where respondents only gave an estimate of their total landholdings.

TABLE IV.4

PERCEPTIONS OF SIZE OF LANDHOLDINGS

(in acres)

LAND	RANGE	MEAN	N
Homesite	0.25-10	1.35	107
Field	0.25-12	3.16	108
Garden	0.25-10	1.60	105

The homesite was where the buildings for cooking, sleeping, and bathing were located. Homesites tended to be located on higher ground and were quite dry. None of the homesites in the research area had a source of water located on site. Kraals for poultry and livestock were usually close by. Some homesites were partially fenced by living fences. With other homesites, it was difficult to know where one homesite began and ended as homesites appeared to be contiguous, with apparently unmarked boundaries.

When asked how many acres their homesite was, respondents gave anywhere between 0.25 of an acre to 10 acres. There were 65 respondents, 52.8% of the population, who estimated the size of their homesite to be between half an acre to one acre. The mean response was 1.4 acres.

The fields were also located on fairly dry land with sandy soil. Generally crops that did not need to be watered were grown in the field. Crops were grown in fields immediately after the rainy season and the field lay fallow the rest of the year with livestock wandering freely and eating the stubble remaining from the previous season's crops. Maize, sorghum, and rapoko were grown in the fields. After the rains, fields were also planted with vegetables, such as tomatoes, rape, squash, and beans. Some homesites were adjacent to the field. Some households had a small field by the homesite with a larger field located away from the homesite, while others had to walk up to 15 minutes to reach their fields. Fields were generally not fenced. Some households had made attempts to plant sisal along field edges to act as a living fence. The field was generally bigger than the homesite. Respondents' perceptions of the size of field ranged from 0.25 of an acre to 12 acres. The mean response was 3.2 acres.

The gardens were very important landholdings for a household. Gardens were located in water discharge areas. These were lower areas, often close to a stream. Soil types were generally less sandy and contained more clay. While fields were tended for only part of the year, gardens tended to produce grains, fruits, and vegetables year round. Gardens were usually a mass of vegetation. Banana, mango, papaw, rice, sugar cane, vegetables, and other trees and crops covered the garden area. Land with water was in short supply in the Mutoko area, and therefore, much too valuable an area to locate a house. Consequently, gardens in the research area were located anywhere from a five to 30 minute walk distance from the homesite.

Respondents' perceptions of the size of their gardens varied. Some had no gardens. The largest garden was a reported 10 acres. The mean garden size reported was 1.6 acres.

Respondents were asked if they felt they had enough land to feed their families. Even though this was an area that had received food for work assistance because of the previous year's drought, 105 respondents (85.4% of the sample population) said they had enough land to feed their families. The remaining respondents thought they did not have enough land. There was a significant difference between men's and women's perceptions of whether or not they had enough land. While 91.6% of the women in the sample responded "yes" to this question, only 72.5% of the men answered "yes." The Pearson chi-square value for this difference between women and men was significant (p=0.00507).

It must be noted that many respondents indicated that "with fertilizer" they had enough land to feed their families. The amount of land did not appear to be a restraining factor in the minds of the respondents. This is in contrast to the literature that implies that farmers in the communal areas do not have sufficient land to meet their needs.

Distance to Water

As mentioned previously, none of the homesites in the study area had a source of water at their home. When asked how long it took to walk to their source of water, responses varied from two minutes to 60 minutes. Water was generally collected by the women. Men often indicated that they did not collect water, so they did not know how long it took. Based on the fact that women tended to collect water, only their responses were used in the analysis. Twenty-eight percent of the women said it took them five minutes or less to walk one way to water, 27.7% said it took them six to 10 minutes, 37.3% indicated that it was a 10-30 minute walk, and 2.4% walked 40 minutes or longer to water. The mean time to walk to the water source for women (N=81) was 13.3 minutes, with the median time calculated at 10 minutes.

Many of the households in the population collected their drinking water from a sacred well. The well was a small depression in the soil with a spring that had stones placed around and partially covering it. There were restrictions regarding the containers that could be used to draw water from this well. The well site was "cleansed" periodically by women in the community. No bathing or laundry was done at this well.

As with people's perception of the size of their landholdings, there are different perceptions of time to the site of water. Using participant research methods in the in-depth interviews, the researcher attempted to ask some time related questions to get a rough determination of the time spent on such activities as collecting firewood or water. These efforts were not very successful. However, respondents appeared to be more comfortable indicating the time taken to collect firewood than the distance to the water site. When interpreting the data on minutes spent walking to the water collection site, it must be noted that there are different speeds of walking, especially between the young and the old.

Livestock and Poultry

The number of animals that a household owns can be an indication of household wealth and relative position in the community. Table IV.5 lists the number of cattle, goats, sheep, pigs and chickens that were reported as owned by the household. Some households cared for additional livestock that belonged to relatives in the city. These latter animals were not supposed to be included in the following statistics, however; it is suspected that some over reporting of livestock occurred.

TABLE IV.5

NUMBERS OF ANIMALS

ANIMAL	FEMALE N=83		MALE N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
CATTLE:						
0	20	24.1	8	20.0	28	22.8
1	5	6.0	1	2.5	6	4.9
2	11	13.3	3	7.5	14	11.4
3	9	10.8	4	10.0	13	10.6
4	8	9.6	4	10.0	12	9.8
5	3	3.6			3	2.4
6-10	15	18.1	15	37.5	30	14.4
11-15	7	8.4	4	10.0	11	8.9
>15	2	2.4	1	2.5	3	2.4
Mean 4.8 Median 3.0 Std dev 4.8 Variance 23.5						
GOATS:						
0	29	34.9	13	32.5	42	34.1
1	4	4.8	4	10.0	8	6.5
2	14	16.9	3	7.5	17	13.8
3	4	4.8	4	10.0	8	6.5
4	8	9.6	2	5.0	10	8.1
5	8	9.6	8	20.0	16	13.0
6-10	11	13.2	5	12.5	16	13.0
>10	4	4.8	1	2.5	5	4.1
Mean 3.0 Median 2.0 Std dev 3.5 Variance 12.6						
SHEEP:						
0	80	96.4	37	92.5	117	95.1
1			1	2.5	1	0.8
2	2	2.4	1	2.5	3	2.4
3	1	1.2	1	2.5	2	1.6
Mean 0.1 Median 0.0 Std dev 0.5 Variance 0.2						

ANIMAL	FEMALE N=83		MALE N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
PIGS:						
0	36	43.4	16	40.0	52	42.3
1	23	27.7	16	40.0	39	31.7
2	17	20.5	4	10.0	21	17.1
3	5	6.0	3	7.5	8	6.5
4			1	2.5	1	0.8
7	2	2.4			2	1.6
Mean 1.0 Median 1.0 Std dev 1.2 Variance 1.5						
POULTRY:						
0	18	21.7	7	17.5	25	20.3
1	5	6.0	2	5.0	7	5.7
2	8	9.6	3	7.5	11	8.9
3	11	13.3	6	15.0	17	13.8
4	10	12.0	2	5.0	12	9.8
5	8	9.6	2	5.0	10	8.1
6-10	19	22.9	9	22.5	28	22.7
11-20	1	1.2	4	10.0	5	4.1
>20	3	3.6			3	2.4
Mean 4.9 Median 3.0 Std dev 6.4 Variance 40.5						

Due to the severity of the drought in Zimbabwe the year prior to data collection, livestock numbers were at a lower than normal level. A common response during interviews regarding the number of cattle the household owned was, "I used to have two cattle before the drought. They are dead. Now I have none." The same held true for other livestock.

None of the respondents specifically mentioned the slaughtering of an animal for funerals when asked about their number of livestock. However, in other conversations, it was indicated that a household must supply meat to those who come to the funeral, and that there would be shame if a cow or goat was not provided. There were many funerals in the Mushimbo area during the research period. While no detailed record was kept on this topic, the researcher estimates an average of one funeral a week. This would create a drain on household animal resources.

Cattle were especially important in ploughing and preparing the land for seeding. Cattle were also valued for their capacity in hauling Scotch carts or wagons that were loaded with produce, firewood, etc. There were 28 respondents (22.8%) who reported that their household did not own any cattle. Three respondents did not know how many head of cattle were owned by the household, but they knew they had some cows; these individuals were not included in the statistical analysis. The majority of the population (48.9%), indicated that their household owned between one and six head of cattle.

Fields were ploughed with one or two head of cattle. However, not everyone who owned cattle necessarily ploughed their fields with their own cattle as the figures in Table IV.6 suggest. Some people's cattle were too old, too young, or "too angry to plough," and so farmers either rented draught animals or borrowed them, usually from relatives.

Donkeys were another draught animal that were used in the Mushimbo area. At the time of the survey there were four donkeys in the local area; two of these animals belonged to a household in the Nyapfura VIDCO.

TABLE IV.6

HOW FIELD IS PLOUGHED

METHOD	WOMEN N=83		MEN N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
Own draught animal	52	62.7	26	65.0	78	63.4
Borrowed	13	15.7	6	15.0	19	15.4
Rented	16	19.3	7	17.5	23	18.7
Other	2	2.4			2	1.6
Not Ploughed			1	2.5	1	0.9

Goats were an important source of meat for the residents in the study area. No one in the area admitted to using goat's milk. Asking about such use caused much laughter and protests that Shona people do not drink goat milk! Goat was the meat most commonly served at gatherings such as farmers days, COOPIBO functions, and church gatherings. The only occasions where the researcher noted beef being served were at a few funeral gatherings and when a cow was "murdered" by an angry farmer whose garden the cow had entered. There were 42 individuals (34.1%) who did not own goats. The majority (47.9%) had between one and five goats.

Sheep were quite rare in the Nyapfura VIDCO. Only six individuals reported owning any sheep. This represented three households. Intrahousehold consistency was low with respect to the numbers of sheep reported. Of the six respondents, four were from the same household in which two individuals reported the household owning two sheep, two reported owning three sheep, and two other household members reported that the household had no sheep. Another of the respondents who reported owning one sheep differed from four other household members who indicated no sheep were owned in that household. No independent verification of responses was obtained with respect to livestock, so the researcher does not know how many sheep, if any, a household actually owned. The discrepancy in reporting could be due to some other definition of "household" that involves animal ownership in the one situation, and possibly, an exaggeration by one household member in the second situation.

Pigs were slightly more frequently owned; 57.7% of the population indicated owning at least one pig. For those individuals that owned pigs, 54.9% owned one pig. The mean number of pigs owned by a household was 1.0.

The most common animals owned by a household were chickens. 79.9% of the sample population reported that their household owned chickens. Chickens were a common sight around the homesite. They generally foraged freely, effecting garbage disposal and pest control. Chickens were sometimes put in pens at night or when they had small chicks "to save them from big birds that eat them."

The mean number of poultry reported was 4.9, with the median 3.0 chickens. This average was skewed by three women who raised chickens and sold them locally and in the Mutoko market (skewness 3.5). These women reported owning 30, 39, and 40 chickens and chicks. However, the majority of individuals, 46.3% of the population, owned between one and five chickens.

Other animals raised by households were pigeons ("doves"), rabbits, and hyrax. One household also reported raising fish in a nearby pond. These were all used for eating purposes, but were so rarely reported that their numbers were not recorded.

The researcher saw no evidence of the use of domestic animal skins for anything other than drums. Some elders were observed wearing small wild animal skins over their shoulders or tied around their waists (over clothes) at some gatherings. No tanning of animal skins was noted during the field research period and there was no mention of tanning and/or selling hides for income generation or for personal use.

Farming Implements

Respondents were asked about the farming implements the household owned. The results of this question are recorded in Table IV.7. The implements discussed are proxy indicators of wealth. These indicators were chosen based on the qualitative data that was collected through participant observation and in-depth interviews. All respondents had buckets to carry water and hoes to work the soil. None of the respondents had tractors or a bicycle in working order. Such low end and high end indicators of wealth were dropped. Two wealthy households in the Ward owned sprayers (backpack type with hand pumps). It was thought only the most wealthy households would own a chemical sprayer. However, four respondents indicated that they had sprayers. These respondents

TABLE IV.7

FARMING IMPLEMENTS

IMPLEMENT	WOMEN N=83		MEN N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
PLOUGH	52	62.7	32	80.0	84	68.3
SCOTCH CART	30	36.1	19	47.5	49	39.8
WHEELBARROW	24	28.9	10	25.0	34	27.6
CULTIVATOR	12	14.5	11	27.5	23	18.7
SPRAYER	3	3.6	1	2.5	4	3.3

were all quite old and were not questioned further about their responses, but it was believed by the researcher and her translator that a sprayer was not actually owned.

Ploughs were an important farming implement, and 62.7% of the women and 80.0% of the men said their household owned one. More people owned ploughs than used their own draught animals to plough their fields (68.3% vs 63.4%). However, more people owned cattle than owned ploughs (77.2% vs 68.3%).

The second most common farming implement owned by households, 39.8% of the sample population, was a Scotch cart. Scotch carts are wagons drawn by an animal(s) and are used for hauling anything from firewood or maize cobs to people. Scotch carts were often handmade crafted entirely from wood. Other Scotch carts had salvaged tires, and a few had metal bodies.

Income Generation

Farmers in the Mutoko area were primarily subsistence farmers. Most food produced by the household was consumed by the household. Yet there were still expenses such as school fees, clothing, and medical care and supplies that required cash. During the initial period of research it became apparent that cash was obtained in a number of ways. Table IV.8 lists the various ways individuals had earned money within the last year.

The most common way that individuals earned cash was through the sale of surplus fruit, vegetables, and grains. This income generating activity was mentioned by 68.7% of the women and 47.5% of the men. Significantly more women than men sold fruit, vegetables, and grains to earn extra income, (p=0.00024). A total of 61.8% of the respondents listed selling produce as a means of earning money.

TABLE IV.8

INCOME GENERATING ACTIVITIES

ACTIVITY	FEMALE N=83		MALE N=40		TOTAL	
	freq.	%	freq.	%	freq.	%
Sell produce	57	68.7 *	19	47.5	76	61.8
Casual labour	48	57.8 *	9	22.5	57	46.3
Sell crafts	20	24.1	11	27.5	31	25.2
Build bricks/bldgs	5	6.0	16	40.0 **	21	17.1
Brew beer	19	22.9 **	1	2.5	20	16.3
Work in town	3	3.6	10	25.0 **	13	10.6
Other	22	16.5	15	37.5	37	30.1
Relatives send $	51	61.4 **	16	40.0	67	54.5

* Chi-square significant between gender at $p<0.05$
** Chi-square significant between gender at $p<0.01$

Casual labour was the second most common way that individuals earned money. Thus 46.3% of the respondents (57.8% of the women and 22.5% of the men) reported that they had participated in activities such as weeding or picking cotton in the nearby resettlement areas to earn extra cash. Once again, significantly more women than men (p=0.00023) worked as casual labourers. These were short-term activities and ones that people did not seem to feel they were paid enough for, however they still participated in them.

Other categories of income generating activities included a wide range of creative endeavours. These business women and men (shanduko in Shona) came up with many ways to earn extra income. Shanduko women would buy bulk quantities of goods such as sugar or paraffin in town and then travel from household to household in the ward selling a cupful for cash or for a basket of grain which they would in turn sell to a prearranged buyer, or keep to brew beer which they would then sell. Another common activity was the making and selling of peanut butter. This was a very labour intensive activity, but there was a guaranteed market for this product. For shanduko men, carving wooden farming or household implements, cutting firewood, tilling others' land, and blacksmithing were activities that were engaged in to earn money.

The second most common way that households obtained cash was through remittances sent by relatives who worked in town. A total of 61.4% of the women and 40% of the men indicated that their households had received money and gifts from family members or relatives living elsewhere. Money earned by husbands, sons and daughters was often mentioned as the source of funds for school fees. These individuals also brought food and gifts when returning to the homesite to visit.

A number of handicraft activities also generated additional income. Some of the women in the study area made clay pots or knitted clothing. The men's activities tended to be weaving reed mats or carving wooden items such as bowls, stirring sticks, and drums. There was no significant difference between the numbers of women and men that sold their handiwork; 24.1% women compared to 27.5% men had been involved in this activity within the past year.

The next two activities were quite segregated between the sexes -- making bricks and building buildings, and brewing beer. There were significant differences, (p=0.004), between women's and men's participation in these two activities. While 40% of the men reported having made bricks or built buildings to earn money, only 6% of the women reported having done so. There was no differentiation in the interviews between making bricks and building buildings. However, while women were seen making and carrying bricks for money, men generally did the actual building of most structures. This seemed to be a male domain. This correlates with the greater number of men compared to women who said they worked in town. A number of men worked as construction labourers in town, then when the job was finished, returned to the Mushimbo.

The reverse appeared to be true with brewing beer. While 22.9% of the women said they brewed beer to sell, only one man said he brewed beer. When this was heard by some of the female respondents they could not believe a man had said he brewed beer and said he was lying, because "men do not brew beer." This statement was supported by participant observation in this study. Many women were seen brewing beer, but men's only involvement appeared to be in the consumption of the beer.

Exposure to Extension or Non-Formal Education Activities

Respondents' affiliations with groups are indicated and discussed in this section as well as their contact with the AGRITEX officer and attendance at farmer days. These affiliations brought people with different ideas and experiences and varying levels of exposure to extension together in groups. Therefore, these affiliations were opportunities to learn and share ideas. Table IV.9 lists the number of respondents having various affiliations, as well as their exposure to extension services.

TABLE IV.9

INDICATORS OF EXPOSURE TO TREE EXTENSION

INDICATOR	WOMEN N=83		MEN N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
AFFILIATIONS:						
ADA	9	10.8	7	17.5	16	13.0
Savings club	39	47.0 *	10	25.0	49	39.8
TNG	22	26.5	5	12.5	27	22.0
Farmers group	26	31.3	15	37.5	41	33.3
Master farmer	12	14.5	9	22.5	21	17.1
Farmer rep.	3	3.6	2	5.0	5	4.1
EXTENSION SERVICES:						
Spoken with AGRITEX	31	37.3 %	22	55.0 %	53	43.1 %
Attended farmers day	30	36.1	20	50.0	50	40.7

* Pearson chi-square significant at $p<0.05$

The Agricultural Development Authority (ADA) was an agency that had a representative living in the Ward. This man had participated in training sessions and was supposed to be available to answer questions regarding the production of produce and how to market it through ADA. Fruits such as mangos, lemons and oranges were handled by ADA, as were the more common tomatoes, cucumbers and squash. Only

13% of the sample population indicated they belonged to ADA, 10.8% of the women and 17.5% of the men.

According to the ADA representative for Eastern Mutoko, ADA had been established in 1987. A minimal flat fee of Z$0.50, lifetime membership, allowed ADA members to sell their produce through the ADA marketing board. A truck would come through Mushimbo once or twice a week and pick up fruit and vegetables that were then taken to Mutoko, sorted, recorded, and sold to various distributors. The main benefit from belonging to ADA was that farmers were saved from having to take their produce to Mutoko or Harare themselves. The downside to this arrangement was that they had no say in the sale price of their produce. The researcher was surprised to note that in one day tomatoes ranged in price from $1.50 to $4.00 a crate. Tomatoes were sometimes sold for $10.00 per crate. Handling and shipping charges were taken off the sale price. Sometimes these fees were more than what the farmer had made by selling the produce.

A higher number of respondents indicated that they belonged to savings clubs (SC) and to tree nursery groups (TNG). The organization that most of the sample population belonged to was a savings club. Of the sample population, 47.0% of women and 25.0% of the men belonged to savings clubs, with a slightly lower percent of the population belonging to a TNG; 26.5% of the women and 12.5 % of the men. While a higher percentage of men than women belonged to ADA, more women belonged to savings clubs and to TNG. Membership in a savings club was the only indicator of exposure to tree extension that was significantly different between men and women in favour of women ($p=0.01963$).

Savings clubs, farm groups, and TNG all received some training from COOPIBO. Farmers' groups and TNG had additional contact with the AGRITEX representative. The Forestry Commission officer dealt only with TNG. Farmer representatives were selected from within a farm group and would represent the group at training sessions.

Master farmer is the term used within Zimbabwe to designate a specific level of training and farming experience. Twelve women (14.5%) and nine men (22.5%) indicated that they were master farmers. Once again, it is not clear that this question was fully understood by the older respondents as they answered this question affirmatively when most likely they would not be recognized officially as master farmers.

The AGRITEX officer lived in Mushimbo by the health clinic and close to the grain mill and shops. This should have made the officer very accessible to any farmers with questions. However, the researcher never saw farmers approach the AGRITEX officer's house.

A change in AGRITEX officers occurred midway through the six month research period. The original officer, had been very involved in the tree nursery groups and extremely enthusiastic about the planting of trees, getting pockets (polyethylene bags that were distributed by the Forestry Commission for planting tree seeds in) and seeds to those who wanted to form TNG. The COOPIBO officer for the Mutoko project reported that this first AGRITEX officer had better results than any other AGRITEX officer in the Mutoko CA in getting TNG started and continuing. The second AGRITEX officer was very sick when he arrived and Mushimbo was consequently without an active AGRITEX officer for approximately two months. The replacement officer had not worked with TNG previously and in two conversations with the researcher did not express much interest in trees or TNG.

Farmers' days were quite a social event in the Mutoko CA, as well as being educational. Farmers' days were sponsored by COOPIBO and were held at the farms of model farmers, those farmers that had volunteered to try different farming methods, or farmers that had exceptional results for the year. COOPIBO supplied money to purchase food. The appeal of meat and sudsa, along with the chance to view different farming practices and share information, drew many farmers from the surrounding area.

VALUATION OF TREES

The main purpose of this study was to determine people's valuation of trees as indicated by the planting and maintaining of trees in the homesite. Therefore, it was important to discover if people had ever personally planted any trees, and the costs involved in doing so. Respondents were asked their opinions on the importance of planting trees in the homesite. They were also asked about the quantity of trees in the area and to speculate on why it took more or less time to collect firewood. In an attempt to determine which types of trees were most important, respondents were asked about trees they would like to be given as well as to rank order cards showing their personal use of trees. The results from these questions and others are contained in the following section.

Tree Planting

The questions pertaining to whether an individual had personally planted a tree, and if so when and where were key to this study. Of the 123 respondents, 95 (77.2%) had planted trees at some stage of their lives.

TABLE IV.10

TREE PLANTING

TREE PLANTING	WOMEN N=83			MEN N=40			TOTAL N=123	
	freq.	%		freq.	%		freq.	%
PLANTED TREES	57	68.7		38	95.0	**	95	77.2
	N=57			N=38			N=95	
WHEN:								
This year	23	40.4		15	39.5		38	40.0
<5 years	27	47.4		18	47.4		45	47.4
6-10 years	9	15.8		8	21.1		17	17.9
10-20 years	12	21.1	*	2	5.3		14	14.7
>20 years	9	15.8		11	28.9		20	21.1
WHERE:								
Homesite	39	68.4		33	86.6	*	72	75.8
Garden	35	61.4		26	68.4		61	64.2
Field	8	14.0		7	18.4		15	15.8
TNG	10	17.5		2	5.3		12	12.6
Other	6	10.5		2	5.3		8	8.4
TREES AT HOMESITE DIE	48	58.5		29	72.5		77	63.1

* Pearson chi-square significant between gender at $p<0.05$
** Pearson chi-square significant between gender at $p<0.01$

Table IV.10 lists the number of respondents that had planted trees and also when and where they had planted trees. There was a significant difference between the number of women and men who had personally planted a tree or trees ($p=0.00111$). While 95% of the males had planted trees, only 68.7% of the women had planted trees.

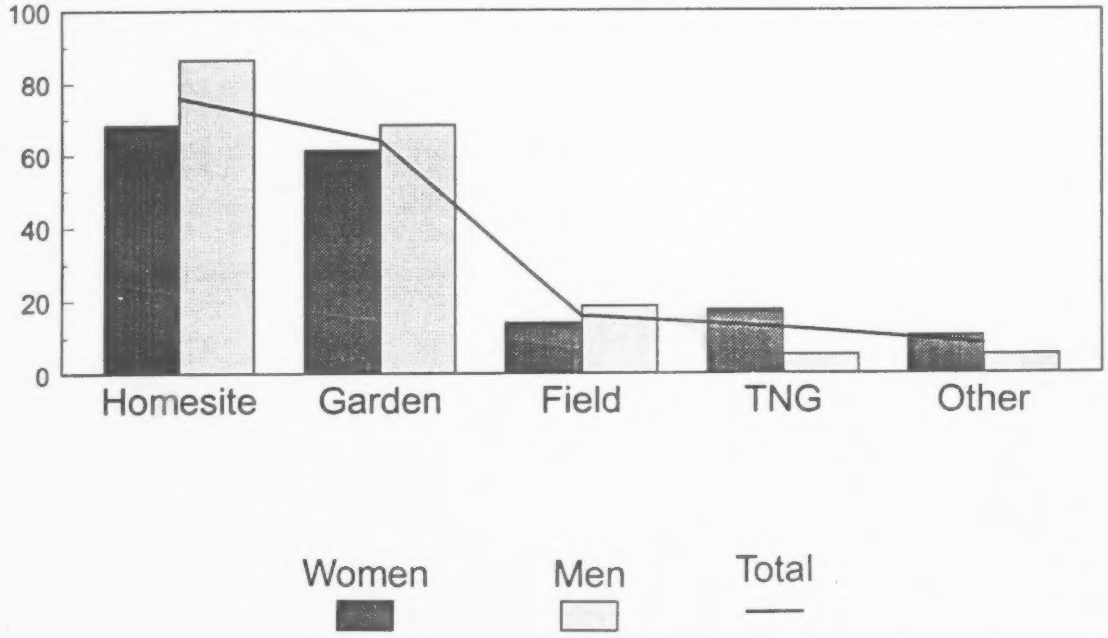
The majority of the tree planting activity, almost 50%, had occurred within the past five years. Over 20 years ago, 15.8% of the women and 28.9% of the men had planted trees. There was a noticeable drop in the tree planting reported during the 6-10 year and 10-20 years ago categories. These would have been during the war and the unsettled pre- and post-independence periods.

Those who had planted trees tended to plant them primarily around the homesite (75.8%), and secondly in the garden (64.2%). As shown in Figure IV.1, significantly more men than women reported planting trees around the homesite, ($p=0.04003$). Of the women who had planted trees, 68.4% reported planting at the homesite compared to 86.6% of men.

Of those who had answered an earlier question by saying they had planted trees, ($N=95$), 71 (74.7%) said a tree they had planted at the homesite had died. Respondents could list more than one species of tree that had died but statistical analysis was done only on the first species they identified. Both women and men had been in the position of a having a tree they had planted at the homesite die, 75.4% and 73.4% respectively. Six respondents said they had never planted a tree, yet when asked if they had planted a tree at their home that had died, they answered "yes." These outliers were not included in the above or following calculations.

FIGURE IV.1

WHERE RESPONDENTS HAD PLANTED TREES



The most frequently mentioned species of trees that had been planted at the homesite and which had died were mangos and papaws. Of the respondents who had trees die, 44.4% said the tree had been a mango, and 17.9% said the tree had been a papaws. The most common reasons for tree(s) not surviving were that animals had eaten them (40.9%), termites (25.4%), or drought (25.4%). There were no significant differences between women and men with respect to the species of trees that died or the reason that the trees had died.

Some of the respondents had interesting reasons for why they had or had not planted trees. An older male household head explained that he had worked in Mazoe, a large orange producing area in Zimbabwe, where he planted orange trees. He felt that this is what had started him planting trees. He had approximately 20 gums planted in his field and fruit trees planted in his garden, and he had planted indigenous fruit trees and papaws on his homesite. He said, "I see that trees can make you money. I want to plant many more trees!" Another older man said, "Where I lived when I was a child there were no trees planted. Later I lived with white people who had fruit trees planted around their home." This man had also planted many trees at his homesite and elsewhere on his land.

A 53-year-old male household head with mulberry, peach, avocado, mango, papaw, muhange, and gum trees planted at his homesite said that his parents had not planted trees around their home. However, he had worked for people in Mutoko with "beautiful trees around their house. I heard from ADA to plant trees and so I copied from other people who planted mango trees in this area. Now I have many beautiful trees to make my house pleasant and my wives and children happy."

Women told different sorts of stories regarding tree planting. Their stories usually explained why they were no longer planting trees. One woman in her seventies, a female household head, had run away from her husband three years ago. She was afraid that her husband would come and take her back. Her father had died and she was farming his land and living at his homesite but never referred to it as her land. She had planted trees when she was a young girl but they had died and that, along with the fear that her husband would come and collect her, was why she said she wasn't planting any more trees. Instead, she was using the four indigenous trees planted by her father.

Another woman in her early 40's had remarried an older man. She had not planted any trees at her new home and said she would not plant any trees ever again. She explained why: "I planted trees at my first husband's home. When he divorced me I had to go away from the trees. I do not want to plant trees ever again."

However, a 54-year-old widowed woman who had been sent away from her home by her in-laws who accused her of killing her husband said, "If you get married you must plant trees so your children can remember you, no matter if you get sent away. I planted trees at my home and my children can (look at them and) remember me." She explained her present situation. "I don't have any land. I am using this land (her nephew's) but I am afraid if I plant trees here that he will take the land away like he took away the garden. He took the garden away after I worked very, very hard in the garden and made it a good garden. If I plant trees he will like this land too and take it away."

Another woman accused of being a witch by her in-laws after her husband died was having a similar land problem. She was temporarily living at a homesite, but would not plant trees there as she had been asked to move by her nephew. She had gone to the kraal head and she had been told the field was hers. She and her son were building a house there and she would plant trees in the field after the house was built. She was appealing to the kraal head to be given a garden.

On a happier note, one woman explained that she planted trees with her TNG. Her TNG had started as a savings club. "With the saving club I brewed beer which we sold for money. When COOPIBO started us to plant seeds in pockets to grow trees and said we could sell the trees for poles, I wanted to grow trees and make money."

Cost and Care of Tree Seedlings

Respondents were asked if they had ever used manure, leaf litter, or anthill soil when caring for their trees. These three materials are added to gardens as a means of enriching the soil and hence increase survival and plant productivity. This question was asked as an indication of effort put into caring for trees as the collection of these materials took time, either going to pens or kraals to collect manure, or going to an anthill or up into the mountains to collect leaf litter.

As it was possible to add manure, leaf litter, or anthill soil to trees that had been planted by someone else, or to trees that had grown naturally, all respondents were asked this question. In total, 84 respondents (73.7%) indicated that they had added one or more of these three soil enrichers to their trees. When all responses for this question were taken into consideration, it was clear that significantly more men than women used a soil additive for their trees (p=0.01398). Only 64.9% of the women, compared to 90.0% of the men, answered yes to this question.

For the purposes of this study, the main interest was in those people who indicated that they had planted trees and the care of those trees. Therefore, the following table, Table IV.11 looks only at the respondents who had planted trees. Of those, 43 women and 35 men said that they had used one or more of the three soil additives to provide nutrients for trees. This amounted to 83.0% of the population that had planted trees.

TABLE IV.11

COST AND CARE OF TREES

EXPENDITURES	WOMEN N=57		MEN N=38		TOTAL N=95	
	freq.	%	freq.	%	freq.	%
Use manure	43	76.8	35	92.1	78	83.0
Buy tree seedling	9	45.8	14	36.8 *	23	24.2
Buy fertilizer	8	14.0	7	18.4	15	15.8
Buy pesticides	1	1.8	1	2.6	2	2.1
Buy fencing	1	1.8			1	1.1

* Pearson chi-square significant between gender at <0.05

Respondents were asked a number of questions that would indicate any cost, in terms of money spent, on planting or maintaining tree seedlings. Costs for tree seedlings, fertilizer, pesticides and fencing vary over time, and with where they were purchased, so it was decided not to focus on the actual cash value, but rather on whether a purchase had been made.

Only those respondents who indicated that they had planted a tree had any expenses related to the purchase or care of the tree(s). The most commonly mentioned expense was tree seedlings. A total of 23 respondents, 24.2% of the tree planting population had bought a tree seedling. There was a significant difference between the number of women and men who had paid money for a tree seedling ($p=0.01894$). Nine women (15.8%) and 14 men (36.8%) had purchased tree seedlings.

Of the 23 respondents who indicated that they had purchased tree seedlings, most had bought the seedling in Mutoko (N=11). The Mutoko nursery, market, school, and even a hardware store were given as sources of tree seedlings. The second source of tree seedlings most mentioned was Mushimbo itself. Five respondents said that a seedling or seedlings had been purchased at the Mushimbo school, while one respondent mentioned a Mushimbo store as the source. Harare was also given as a source of tree seedlings, with five respondents making their purchase in the capital and bringing them back to Nyahunure Ward.

The second most commonly mentioned expense was that of fertilizer. Of those who had planted trees, 15 people (15.8%) said they bought fertilizer for use on their trees. One woman and one man both indicated that they had bought pesticides to use on their trees. As with those who said they bought fertilizer for their trees, it is probable that the fertilizer and the pesticides were bought primarily to be used in the field and in the garden, but some might have been applied to trees as needed.

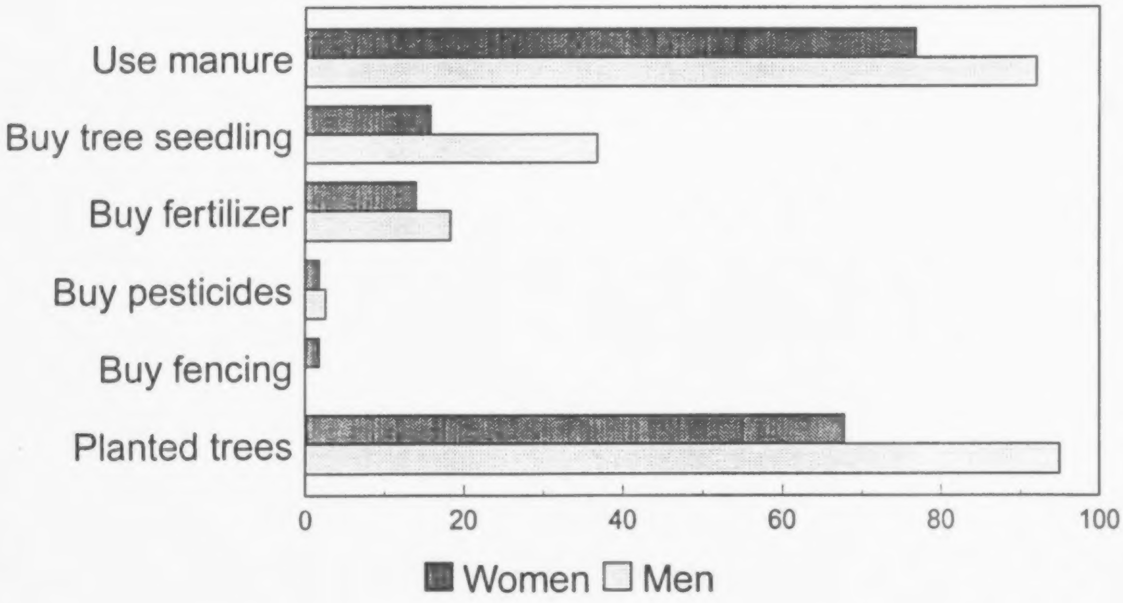
Only one woman bought fencing for her trees. In her situation, she did not actually buy fencing material but paid someone to make fences for her seedlings. She lived by herself and received money from her children. It certainly was not common practice to hire someone to build fences around tree seedlings.

A typical response to the question regarding fencing was, "Money is a problem for fencing." Some respondents appeared to think that wire fencing was necessary. While this might be considered a valid concern for TNG with 50 trees or more, barbed wire fences would not have been appropriate for individual trees. Most households with fencing around their trees had constructed fences with branches and twigs stuck in the ground and held together by bark string. Some of these fences were very sturdy and would keep animals from eating the seedlings. Other fences were three or four small branches stuck in the ground, futile protection from hungry cows or goats.

Figure IV.2 illustrates the number of respondents who had planted trees as well as the details of different costs involved with tree planting.

FIGURE IV.2

COST AND CARE OF TREES



In addition to any costs that might have been incurred by purchasing a tree seedling or items to care for seedlings, respondents were asked if they had paid to join a tree nursery group (TNG). Five respondents indicated that they had done so. The cost for joining a TNG appeared to vary. One woman said it cost $0.50 to join, while three women said it cost $1.00 to join. Only one man said he had incurred this expense with respect to his trees; for him, it cost $2.00 to join a TNG. All other respondents said they had not had to pay to join a TNG.

Some respondents had indicated earlier that fees had prevented them from joining a TNG. "It is too expensive" was the common explanation. One woman said the cost in her village was $20.00! Two other respondents said it cost $10.00 to join a TNG and was therefore too expensive for them. When TNG had originally formed in the area there had been no fees. For those who chose to join the TNG after it had planted trees, a small fee was set and charged by each individual group. The cost of the entrance fee varied depending on who answered the question; however, the researcher was never told of a fee higher than $2.00.

Is it Important to Plant Trees?

Respondents were asked if they regarded it as important to plant trees around the homesite. The resounding response was YES, it was important to plant trees around the homesite. Only one of the 123 respondents said it was not important and the reason she gave was that there were already enough trees around her homesite. Table IV.12 lists the main reasons given by respondents when asked why it was important to plant trees around the home. There were 82 women who responded to this question and 40 men; however, multiple responses were given.

There was a significant difference between women's and men's reasoning on why it was important to plant trees ($p=0.02524$). There was also a significant difference with the Spearman correlation being significant at 0.01490.

TABLE IV.12

REASONS FOR IMPORTANCE OF PLANTING TREES

REASON	WOMEN N=125		MEN N=63		TOTAL N=188	
	freq.	%	freq.	%	freq.	%
Fruit	54	43.2	21	33.3	75	39.9
Shade	32	25.6	14	22.2	46	24.5
Windbreak	4	3.2	7	11.1	11	5.9
Children	9	7.2	1	1.6	10	5.3
Money	9	7.2	1	1.6	10	5.3
Firewood	5	4.0	5	7.9	10	5.3
Poles/Planks	4	3.2	5	7.9	9	4.8
Oxygen	2	1.6	4	6.4	6	3.2
Other	6	4.8	5	6.4	11	5.8

Fruit and shade were the two most common responses given for why it was important to plant trees around the home. The most commonly supplied reason for why it was important to plant trees around the homesite for both women (43.2%) and men (33.3%) was because of the fruit that a tree would provide. Shade represented 25.6% of the reasons provided by women and 22.2% of the reasons provided by men. Men placed more importance on the windbreaking value of trees at the homesite, 11.1% of the reasons given, while only 3.2% of women gave this as a reason. Women appeared to place a higher priority on having trees at the homesite to please their children , as well as the trees' money making and/or saving values. While nine women mentioned the importance values of children and money, only one man did so.

The respondents who listed oxygen or environmental reasons for the importance of planting trees around the home were younger. Their responses tended to sound like textbook answers as the following example illustrates. Homesite trees are important because "trees help with oxygen and stop soil erosion." One of those who volunteered this response was qualified to be a teacher.

Other examples of comments provided by respondents who said that it was important to plant trees at the homesite and then explained why are as follows:

> To help in the future; I will get money and fruits from the mangos.
>
> For fruits and the children will like them because I am the one who planted them.
>
> For shade and for the chickens to hide in so they are not taken by birds.
>
> To have enough fruit for the children. If I don't plant trees the children will go and steal fruit.
>
> Because it is easier during the rainy season; the children won't have to go to the garden to get fruit - it will be here.
>
> If there are trees when there is sun, then you can sit in the shade.
>
> Because of fruits and poles.
>
> Because then I will not have to go to other people for fruits.
>
> It's important because trees avoid the heavy winds.
>
> Because the trees give me money to buy fertilizer. Last year I sold mangos and bought fertilizer.
>
> So you can say "help yourself to some of the fruit growing on the trees" when people visit.
>
> For fruit for the visitors that come. First you will be given fruit while the sudsa is cooking and then eat sudsa.
>
> Important to plant so that when you die you leave some(thing) for the children. Gives fruit and firewood.

While most people thought it important to plant trees, not everyone actually put this belief into action. One older lady who thought it was important to plant trees qualified it with this statement, "I'm not (going to) as I don't have eyes."

Respondents were also asked if there were any trees that should not be planted around the homesite. A total of 33 respondents said yes there were certain trees that should not be planted at the homesite and then proceeded to list from one to four different species and reasons why they were not suitable. All but four of the respondents listed indigenous trees. Some of the reasons for not planting certain indigenous trees are listed below:

> Because the Mutowa is used ritually when people die.
> Because Mutsvatsva changes all the rules in the household
> Because it brings snakes
> Because the thorns are dangerous
> Because it will bring lightning.
> Because my parents told me not to have by my home.
> It has a bad smell.

There was only one exotic tree that four respondents said should not be planted by the home, and that was the gum tree. Two of the respondents said the gum should not be planted at the homesite because the tree attracts lightning; the other two respondents reason were because the gum tree could fall on the house.

Past and Present Comparisons Regarding Trees

Two questions were asked to gauge respondents' perceptions of past and present tree availability. One question asked respondents to look around them, in the mountains, and around their homes and gardens before telling the researcher if they thought if there were more, less, or the same number of trees and shrubs growing now as when they first lived in Mushimbo. In another question, respondents were asked if it took them more, less, or the same amount of time to collect firewood as when they first lived in Mushimbo. Table IV.13 lists the results from these questions.

TABLE IV.13

PAST AND PRESENT COMPARISONS REGARDING TREES AND FIREWOOD

COMPARISONS	WOMEN N=83		MEN N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
# OF TREES:						
More	29	34.9	6	15.0	35	28.5
Less	46	55.4	30	75.0	76	61.8
Same	7	8.4	3	7.5	10	8.1
Don't know	1	1.2	1	2.5	2	1.6
TIME TO COLLECT FIREWOOD:						
More	66	79.5	37	92.5	103	83.7
Less	11	13.3	2	5.0	13	10.6
Same	6	7.2			6	4.9
Don't know			1	2.5	1	0.8

Both women and men thought that there were fewer trees and bushes in their area now. A total of 61.8% of the sample population, 55.4% of the women and 75% of the men, felt there used to be more trees in Mushimbo. Still, 34.9% of the women and 15.0% of the men perceived that there were more trees now than in the past. Reasons why they felt there were more trees were because people were planting trees in TNG, and were planting trees in their gardens.

There was more agreement on whether it took more or less time to collect firewood these days; 79.5% of the women and 92.5% of the men indicated that it took longer to collect firewood. This was because they had to travel further distances, the big trees were gone, and more people lived in the area now. Thirteen people, 13.3% of the women and 5.0% of the men, thought that it took less time to collect firewood now.

Respondents who answered that the time it took to collect firewood had changed were asked why they thought a change had occurred. Their reasons included the following:

> People are cutting trees down. Now I have to go far to get firewood. Near trees have been cut.
>
> There are more people now and they have cut trees to fence their gardens.
>
> The amount of firewood used by a family is the same now as before, there are just more people so the rate of cutting trees is higher.
>
> People didn't cut down the trees long back. Now they do and they don't plant new trees.
>
> Overpopulation; people are collecting lots of firewood.
>
> Because there are many people. Long ago there were very few people.

> People are cutting down trees and then there are fewer trees. I have big trees in my field, others don't. I haven't cut them down because I use them for firewood. How? I cut the branches, I don't cut it all down.

There were a number of comments that seemed to point at the small-scale farmers as the reason why it took longer to collect firewood as the following indicate:

> Because there are many people and because land was given to small-scale farmers and now I can't get firewood there any more. Three years ago the land was given to small-scale farmers and it (firewood) has been a problem.
>
> Because small-scale farming has been introduced and they don't allow us to collect firewood there any more.

However, not everyone agreed with the above comments that there were fewer trees or that it took longer to collect firewood:

> We are planting trees these days and collecting firewood from them. Also, trees are growing on the mountains.
>
> It takes less time to collect firewood because there are more trees on the mountains now.
>
> Because the trees are growing and are tall there is more firewood. I only collect firewood from big trees not small.
>
> Because people are being given trees to plant.
>
> Down here there were plenty of firewood trees but people are ploughing the land.

Some respondents said that while trees had been planted they were not trees to be used for firewood:

> There are more fruit trees now, but fewer trees in the mountains.

> We are collecting firewood from very far away these days. Nearby (trees) are disappearing. The trees that are increasing are fruit trees, not ones which can be used for firewood.

One male head-of-household had this comment to make which he thought would solve the problem of increasing firewood collection time:

> I must go very very far now. People are cutting trees down for making fire (to bake bricks). They should cut few trees and plant many.

There appeared to be some local rules pertaining to the collection of firewood which some of the above comments touch on. Trees should not be cut down for firewood, just dead branches taken, and fruit trees should not be cut down for firewood or any other purposes. There were some other indigenous trees which a few respondents indicated should never be cut down. Two areas in the vicinity were sacred and wood collection was not allowed there at all. However, not everyone believed in these rules, or believed in them but did not practice them. One example of this occurred during an interview with a woman cutting firewood. When asked why she was cutting down the tree she responded, "I am not cutting down the tree, I am just taking the dead branches." However, the "branch" she was cutting was the main trunk of the tree and it had green leaves growing on it.

Men were involved in collecting firewood. However, they did not tend to collect firewood on a day-to-day basis the way women did. Men were seen chopping down larger trees and then collecting these trees with a Scotch cart. Women were seen accompanying men to collect firewood when a Scotch cart was used. Usually, however, women tended to collect firewood singly or with other women and in these instances they would carry the wood on their heads.

There was some inconsistency between the responses of these two questions. When responses appeared contradictory, the researcher attempted to determine the reason(s) through the use of probes. Some responses were changed when asked if there were fewer trees now, why it took them less time to collect firewood, or visa versa. The researcher is also not certain that the concept of these two questions comparing the past with the present was fully understood by all the respondents.

When interpreting the results from these two questions there are a few factors that must be kept in mind. Some of the older people said they walked slower so it took them longer to collect firewood. Others said that they could carry bigger loads now than when they were young so it took them less time to collect firewood. Still others said now they had a Scotch cart to help with the collection of firewood, so it took them less time than before. As well, some respondents had lived in the area for over 60 years, some for 10 years and others for only a year.

When crosstabs were run comparing the perception of the time it took to collect firewood with the perception of whether there were more or less trees and shrubs, the Pearson chi-square are significant ($p<0.001$). The majority of the people who thought it took more time to collect firewood now than it did in the past, 72.8% of the respondents, thought there were fewer trees and shrubs now. However, the majority of the people who thought there were more trees and shrubs now, 62.9% of the respondents, also thought that it took more time to collect firewood.

When crosstabs were run comparing the perception of the time it took to collect firewood now, reflecting back on the time it took in the past, with how long the person had lived in the area, the results were not significant.

Tree Inheritance

Respondents were asked if they planted a tree who would the tree belong to when they died. The majority of the population, 73% (N=122), reported that the tree would belong to one of their children. For 48.2% of the women, this would be their sons. Five women (6.0%) specifically said their first born son would own the tree when they died. The differences between the responses given by women and men approached significant levels. Only nine men (22.5%) indicated tree ownership passing onto their sons, and only 3 men (7.5%) specified their first born son. Instead, a more common response for men was that the tree would belong to the children, regardless of gender, or that the tree would belong to all those who were living at the home. Each of these responses was given by 12 men, or 30% of the male population. There were 22 women (26.5%) that envisioned tree inheritance going to children of both genders, and their third most common response (15.7%) was all those people living at home. Only one woman and one man indicated that the tree would belong to their spouse when they died. As can be seen in Table IV.14, there were no significant differences in the way that women and men answered this question.

When respondents who answered that the tree would be inherited by their son were asked why the son(s), and not both sons and daughters would inherit the tree, invariably the response was "because the daughter will marry and go away." In one interview the researcher pointed to a divorced daughter who had returned to the household and said "but sometimes they come back, who will inherit the tree then?" The respondent answered, "The son and grandson, because it's their property. Daughters can just use it, but it belongs to the son." Another male household-head expanded on this thought when he explained why the tree would belong to his son. "It is Shona custom. If men die all the property goes to the son even it the mother is still alive. The son will take care of the mother and the family." A female household-head explained that the tree would belong to "Both boys and girls. If girls get married they can come back and eat the fruit." but implied that as the boys would be here the tree would really belong to them.

TABLE IV.14

TREE INHERITANCE

WHO WILL INHERIT TREE WHEN YOU DIE	WOMEN N=82		MEN N=40		TOTAL N=122	
	freq.	%	freq.	%	freq.	%
Sons	40	48.8	9	22.5	49	40.2
Children, both sexes	22	26.8	12	30.0	34	27.6
All those at home	13	15.9	12	30.0	25	20.5
First born son	5	6.1	3	7.5	8	6.6
Spouse	1	1.2	1	2.5	2	1.6
Other	1	1.2	3	7.5	4	3.3

Free Seedling

In the interview schedule the question was posed: "if you were given a free tree seedling by the government, what species of seedling would you want to be given?" After the response, people were asked what their second choice of tree seedling would be if their first choice was not available, and then this was repeated to obtain a third choice of tree seedling. The question was asked to determine what sort of trees the respondents would prefer to plant, unlimited by the type of seedlings they had given to them via COOPIBO, or the Forestry Commission, or had regenerating in their gardens. The results of this question are given in Table IV.15.

When respondents were questioned about the trees they had planted on their homesite, the tree species they would most like to be given free from the government, or related questions, the responses obtained did not always refer to what is technically defined as a tree. However, for the purposes of this study, what a respondent considered a tree was taken to be a tree, even if it was a bougainvillaea, granadilla, or papaw that was being discussed.

Table IV.15 lists only the top six most mentioned species. However, other species given included lemon, apple, guava, bougainvillaea, jacaranda, pine, cypress, and indigenous trees. It is interesting to note that most of the species that people would like to be given are fruit trees.

There were not significant differences between men and women in the type of free tree seedling they would like to receive. The Spearman correlation was approaching significance ($p=0.07038$) for the first choice, but was not significant for the second and third choice of tree seedling

TABLE IV.15

FREE TREE SEEDLING, FIRST, SECOND, AND THIRD CHOICE

TREE	WOMEN N=83		MEN N=40		TOTAL N=123	
	freq.	%	freq.	%	freq.	%
FIRST CHOICE:						
Orange	26	31.3	16	40.0	42	34.1
Mango	18	21.7	3	7.5	21	17.1
Gum	10	12.0	9	5.0	19	15.4
Avocado	11	13.3	2	5.0	13	10.6
Papaw	4	4.8	1	2.5	5	4.1
Naches	3	3.6	2	5.0	5	4.1
SECOND CHOICE:						
Mango	14	16.9	5	12.8	19	15.6
Orange	10	12.0	7	17.9	17	13.9
Avocado	8	9.6	7	17.9	15	12.3
Papaw	12	14.5	1	2.6	13	10.7
Gum	6	7.2	5	12.8	11	9.0
Peach	4	4.8	3	7.7	7	5.7
THIRD CHOICE:						
Mango	10	12.8	7	18.9	17	14.8
Papaw	10	12.8	5	13.5	15	13.0
Peach	11	14.1	3	8.1	14	12.2
Gum	9	11.5	2	5.4	11	9.6
Orange	7	9.0	3	8.1	10	8.7
Muhange	8	10.3	2	5.4	10	8.7

Where to Plant Free Seedling and Why

When asked where they would plant the free seedling, the majority of respondents chose the homesite. Of the 121 respondents who knew where they would plant a free seedling, 67 (55.4%), would plant a free seedling at the homesite, 46 (38.0%), of the respondents would plant the seedling in the garden, and 8 (6.6%), would plant the seedling in the field.

The reasons given as to why they would plant their seedling in a certain location was very interesting. For the 67 respondents who said they would plant a free seedling at the homesite the reasons given varied.

There were 26 respondents whose reason for planting a tree at the homesite was that the tree would be safer there than if it was planted elsewhere. Some respondents felt the fruit from their trees was less likely to be stolen if the tree was at the homesite where they could keep an eye on the tree. Three respondents mentioned the threat of baboons, "If the tree is here I, or the children, will throw rocks at the baboons so they will not eat the fruit."

Other comments put forth by respondents regarding why they would plant a free tree seedling at the home included:

> Animals may eat fruit if the tree is planted in field or garden as we are far away.
>
> To make sure it is not eaten by the cattle.
>
> So goats won't eat it.

One female head of household who was older than 65 years of age said that "When the animals come I will see them. I will sweep around the tree." A male household head was more concerned with people getting the fruit, "So people don't come and pinch the fruit in the night." A female household head agreed with him when she said she had planted her trees around her homesite, and would plant a free tree seedling by her home "so that I will be seeing the trees so people will not steal them." Another woman supported this with her statement, "at home it is easier. Trees in my garden have had fruit stolen. If tree is here (at the homesite) they won't steal the fruit."

Stolen fruit appeared to be a real concern. There were three other respondents who indicated that fruit had been stolen from their trees. One male told the researcher that large gum trees he had planted had been cut down and taken when he was away for a funeral.

There were 18 respondents whose reason given for planting at the homesite was because it would be easier to care for the tree seedling. It appears that some respondents felt they would be more likely to water and weed the seedling if it was at the homesite where they would see it all the time as the follow examples illustrate:

> So it will be near and we will take care of it.
>
> If I plant them in the field they will dry up because it will be too far to water them. I will look at them here (in the homesite) and look after them if they are near.
>
> Tree is easier to water if close by.
>
> Because you have to see it and take care of it.
>
> To provide shade and for me to provide it with it's requirements for growth.

As the last comment shows, shade was a reason why it was important to plant trees at the home. Shade was the third most common reason given for planting a tree seedling at the homesite. A total of seven respondents said they would plant a free tree seedling at their homesite for the shade that it would provide for them.

Three other respondents suggested that they would plant at the homesite for reasons of aesthetic. As one woman said "I want my home to look like my garden, green with lots of trees."

Not everyone agreed that the homesite was the best place to plant a free tree seedling. For those who would plant their seedling in the garden, 24 cited the fact of a fence around the garden which would protect the seedling from being eaten by cows or goats. Another 13 listed availability of water in the garden as the reason why they would plant in the garden. One woman said she would plant a seedling in the garden because, "it (the seedling) will be eaten or dry up if I plant it at my home on in the field. The garden is fenced and will be safe."

Ranking

Respondents were given ten cards with drawings showing ten different uses of trees. The drawings on the cards were done by a local secondary school student with one to four drawings per card depicting local tree and wood usage. A selection of the cards used in the interviews are illustrated in Appendix 3. Respondents were then asked to place the cards in the order that they personally found to be the most important to least important.

Five of the 123 respondents did not participate in this section of the questionnaire so the following discussion is based on the rankings of 118 respondents. Others did complete this section but had difficulty in ranking all ten cards.

The 10 cards depicted the following uses of trees:

PLANKS - for construction of modern homes
POLES - used for fences, huts, kraals
HHLD IMPLEMENTS - such as stirring sticks, mortar & pestle, bowls
FARMING IMPLEMENTS - such as hoes, axes, carts, yokes
FODDER - for livestock
SHADE
FRUIT - for eating and for sale
FIREWOOD
MEDICINE
FLOWERS

The main response for the most important use of trees, USE1, was planks. Of the respondents who answered the ranking question 61 (51.7%), chose planks as their most important use of trees. The second most common response for the most important use of trees to an individual was farming implements for 10 respondents (8.5%).

The second most important use of trees, USE2, showed much less variance in the responses. The most common response was household implements, 22 respondents (18.6%), followed closely by farming implements 18 respondents (15.3%). Planks, poles and firewood were of equal frequency each with 16 respondents.

For the third most important use of trees, USE3, 21 respondents (17.8%) chose household implements. The second most common response was tied with farming implements and shade, each with 18 or 14.6% frequency. Firewood was the next most frequent response with 16 (13.6%) choosing it as their third most important tree use.

In a number of cases, when asked to do the ranking question, respondents told a story with the cards. The respondents that made up a story as they did their ranking were all women, usually women 45 years or older. One 65 year old woman started off her ranking by placing first the card with planks, followed by household implements, firewood, and flowers. The story that she told as she placed the cards in order down went as follows:

> In my house I need a door, then I need to pound maize so I can feed my family. To cook the food I've prepared I need a fire. Then I want to have flowers around my house.

Another woman in her mid 50's ranked fruit seventh, medicine eighth, fodder ninth, and flowers tenth importance. She told a story as she placed the cards that ended with the following:

> Sometimes the children will get ill after eating too much fruit so I give them medicines. Flowers are last because after my children eat the fruit they will be happy and plant flowers.

A more meaningful indication of the most important use of trees can be gained from determining a weighted average for each use. The weighted average was calculated by giving each USE1 a weight of 10, USE2 a weight of 9, and so on for each of the 10 different uses of trees. The total of each tree use category was then divided by the number of respondents to give the weighted averages which are presented in Table IV.16.

Another way of interpreting the ranking question is by studying the Pearson chi-square values and Spearman rank order correlations. When a Spearman correlation is done on the above weighted average of ranks, a coefficient of 0.8303, significant at 0.003 is obtained. This indicates that there is a positive correlation between how women and men ranked the ten uses of trees, as illustrated in Figure IV.3.

TABLE IV.16

WEIGHTED AVERAGE OF RANKING OF TREE USES.

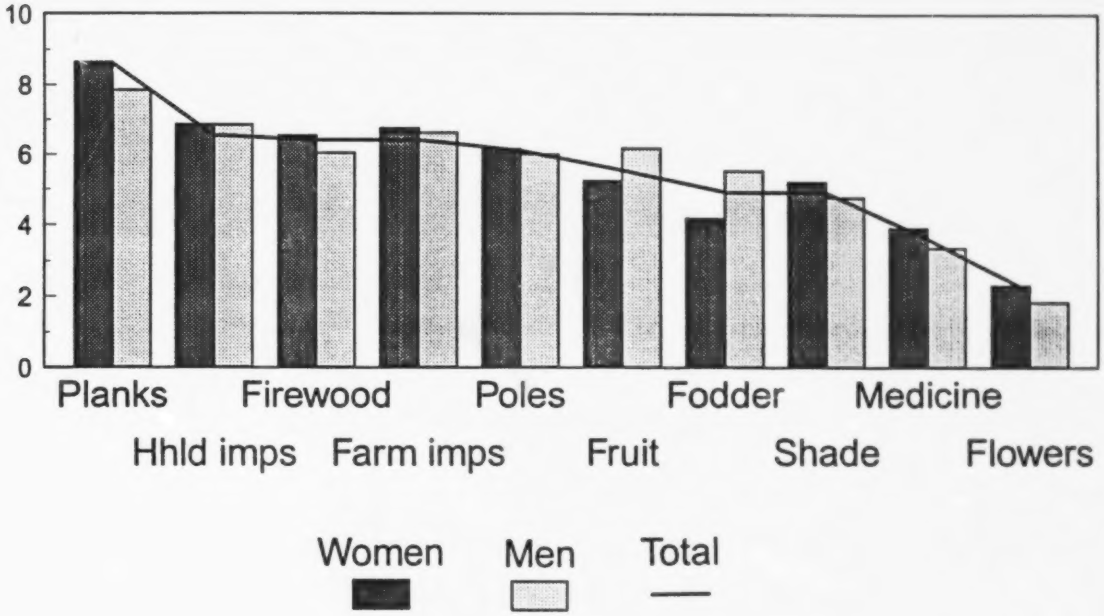
TREE USE	WOMEN N=80	MEN N=38	TOTAL WEIGHTED AVERAGE N=118
Planks	8.64	7.84	8.61
Household implements	6.86	6.84	6.53
Firewood	6.54	6.03	6.39
Farming implements	6.74	6.61	6.39
Poles	6.15	6.00	6.10
Fruit	5.25	6.18	5.55
Fodder	4.19	5.53	4.93
Shade	5.21	4.78	4.92
Medicine	3.92	3.36	3.64
Flowers	2.31	1.84	2.16

1 = least important
10 = most important

When Spearman correlations are done on the responses for USE1, USE2, etc., there are no significant correlations. There are, however, some significant values obtained by running Pearson chi-squares. When this is run for each of the responses, USE1 through USE10, there are three significant differences. The responses for the second, fifth, and sixth most important use of trees are all significant at <0.05.

FIGURE IV.3

WEIGHTED RANKING OF TREE USES



When chi-square analysis was run on the various possible uses there were two that showed a significant difference in ranking by women and men. That most significant was firewood (p=0.00441), and the other was medicine at (p=0.01041).

TREE MAINTENANCE AND USE

The third and final portion of this chapter discusses the maintenance and use of trees planted on the homesite. By understanding who cared for the trees, how the trees were cared for, and who made the decisions regarding the activities surrounding the trees, as well as how the trees were actually used by the household, it will be possible to gain a better understanding of the value of the homesite trees to the people in the Mushimbo area. As one of the objectives of this study was to determine if there were differences between female and male-headed households in tree valuation, the majority of the discussion in this section will be divided into responses from female-headed households and male-headed households.

Not all family members interviewed gave details on tree maintenance and use. When more than one family member did give these details, the facts about the trees varied, at times widely. To ease discussion, and to eliminate confusion caused by the inconsistencies between intrahousehold responses, most of the data in this section will represent the answers of heads of the households. In this study, household heads tended to be the best informed about the origins of the trees and as a result gave more complete information about the household trees than did other household members. While the differences between the perceptions of members within the same household with respect to tree use and maintenance are interesting, for the purposes of this study they will not be discussed.

As mentioned earlier, there were six households where interviews from the household head were not obtained. In four of these instances, responses from spouses were used to represent the household head. For one household where the male head declined to answer questions due to his advanced age, his oldest son's responses were used. Finally, one household was dropped from the analysis in this section as the replacement for the head of the household was not well informed about the household trees.

On the whole, people were very skilled in tree identification and well versed in the various uses of the species. Only once was there a respondent who did not know the name of a tree that had been planted in the homesite. People in the Mushimbo area were familiar enough with trees that they could look at dried firewood and identify the species.

While the previous section looked at respondents' valuation of trees in general, this section is concerned only with trees planted at the homesite. Some of these trees may have been planted before a respondent was born, or had moved to the site. Other trees may have been planted when a respondent was living away from the homesite such as when they were working in town or before they were widowed or divorced and returned home. Therefore, some of the responses were based on what the respondent had been told about a tree's history and their perceptions of the activities surrounding a tree.

Trees Planted At The Homesite

A total of 104 respondents gave details on the trees which had been planted in their homesite. Of the 104 respondents, 68 were female and 36 were male. This also represents 40 individuals from female-headed households and 64 individuals from male-headed households. Of these respondents, 30 represent the female head and 28 represent the male head of household. Table IV.17 compares the total number of respondents to those respondents with trees planted in their homesite.

The number of planted trees that people (N=104) reported having on their homesite ranged from one tree to 101 trees. In all, a total of 1,739 trees were recorded as having been planted at homesites. This represents responses from 58 of the 67 households in the sample population. The mean number of trees for households that had planted trees was 16.7 trees per household.

TABLE IV.17

COMPARISON OF TOTAL RESPONDENTS TO THOSE WITH TREES

	TOTAL	RESPONDENTS WITH TREES	CASES FOR HHLD HEADS
TOTAL RESPONDENTS:	123	104	209
Female	83	68	
Male	40	36	
# respondents in FHH	50	40	97
# respondents in MHH	73	64	112
# OF HOUSEHOLDS:	67	58	125
FHH	36	30	
MHH	31	28	

FHH - Female-headed household
MHH - Male-headed household

The majority of the respondents (N=40) indicated that there were between one and five planted trees on their property. There were 20 respondents who had 6-10 trees on their property, 22 respondents said they had 11-20 trees, and 13 respondents had 21-50 trees. Nine respondents indicated having over 50 trees planted on their property. Table IV.18 lists the number of planted trees reported grouped into female or male-headed households.

TABLE IV.18

NUMBER OF TREES PLANTED AT THE HOMESITE
(all respondents)

# OF TREES	FEMALE-HEADED HOUSEHOLD N=40		MALE-HEADED HOUSEHOLD N=64		TOTAL N=104	
	freq.	%	freq.	%	freq.	%
1-5	19	47.5	21	32.8	40	38.5
6-10	5	12.5	15	23.5	20	19.2
11-20	10	25.0	12	18.7	22	21.2
20-50	1	2.5	12	18.7	13	12.5
>50	5	12.5	4	6.3	9	8.6

When recording the number of trees and shrubs that were planted on the homesite, any trees that had been planted as a living fence were not included. Living fences contain a large number of trees or shrubs and it was felt these numbers would skew the results and significance of other trees that had been planted at the homesite. Muchobve was often planted as a living fence.

The data in this section must be interpreted with caution. Not all household members gave information on the planted trees in their homesites. The reasons for non-reporting were many. Some respondents said that their memory was not good enough to answer questions about the trees, other respondents said they had spent enough time answering questions, others, such as wives and in-laws, said they didn't know enough about the trees to answer the questions about them, while still others said that what other household members had said about the trees was enough.

Types of Trees Planted

The warm climate of Zimbabwe allows for a great diversity in flora. The people of Mushimbo took advantage of this opportunity and had planted a number of different species of trees in their homesites. While this study did not focus on the trees planted in the gardens, it is worth noting that the diversity of tree species found in the gardens was much greater than that found in the homesite, due mostly to the availability of water in the gardens.

For this section, "tree" will refer to any woody herbaceous plant the respondents considered to be trees that had been planted on the homesite, even though flora such as papaws, granadilla and bougainvillaea are not technically classified as trees. This study also used common names, both Shona and English. One problem with not identifying all trees and not using Latin names is that species may be incorrectly identified, or have several Shona names. Common names differ for the same tree species in different regions of the country and many of the wives in the study had moved to the research area only after marriage.

To reduce the variance in names, in situations where the researcher and her translator were familiar with the tree they would ask the respondent if the tree was also called "____" and gave the name. If the respondent agreed with the name proposed by the researcher and the translator then the tree was recorded by that name. If the respondent did not agree with the proposed name, the name originally given was used.

As this research took a sociological approach, not a biological approach to trees, it is hoped that this reduction of tree names will enhance the study rather than detract from it. There are numerous studies that discuss indigenous trees and their various uses.

See Chiddari, Chirambaguwa, Matsvimbo, et al. (1992) for a detailed study on trees in Zimbabwe and their uses by females and males.

The types of trees planted in the homesite can be roughly grouped into exotic and indigenous trees. Aside from the exotic/indigenous grouping, trees can also be grouped according to main use indicated by respondents: fruit; wood; flowering; and other. Table IV.19 indicates the breakdown of trees into the two grouping by origin or by use. Trees placed in the OTHER category could have be primarily used for shade, or for medicinal purposes, or poles that had been stuck in the ground for use initially as a laundry post which had taken root and continued growing. Although the people of Mushimbo did not refer to trees as exotic or indigenous, these groupings are utilized for ease of discussion.

TABLE IV.19

TREE GROUPINGS

TREE TYPE	TOTAL # OF TREES N=1,739		CASES OF HOUSEHOLD HEAD TREES		
	freq.	%	FHH N=97	MHH N=112	TOTAL N=209
Exotic	1,537	88.4	69	88	157
Indigenous	202	11.6	28	24	52
Fruit	914	52.6	59	72	131
Wood	775	44.5	27	30	57
Flowering	12	0.7	2	5	7
Other	38	2.2	9	5	14

A listing of the 40 known species of trees planted on the homesites is contained in Appendix 4.

It must be noted that the remaining tables and figures in this section will be based on cases. Cases refers to a species of tree or a collection of one species of trees planted at a particular time reported by a household head. For example a household head might report having 5 mangos that were planted 20 years ago, 3 mangos planted within the last year, and one gum planted within the last year. This would be considered three cases. To translate cases into actual numbers of trees for the purposes of discussion became numerically confusing. As trees in each case appeared to be planted, cared for, and used in an equal manner it was considered appropriate to treat them as one unit. However, these units should not be thought of as individual trees.

In the vast majority of cases (88.4%), the trees which had been planted on the homesite were exotic trees. This observation held true for both female-headed households and male-headed households. Generally the trees planted were mango, papaw, gum and jacaranda trees. When trees were analyzed according to type of tree, fruit trees were the tree most commonly planted in both female and male-headed households.

A number of respondents indicated that, "all trees can be planted." Still, there were other respondents who felt that only certain types of trees should be planted, "We do not need to plant trees for firewood, there are lots of trees in the mountains. We need to plant fruit trees." Another respondent had this to say about planting trees, "Only fruit trees should be planted because they will bring money to the home."

Tree Sources

Respondents were asked about the origins of the trees they had planted on their homesite. Not all respondents knew where the tree had originated from. In the 200 cases where the household heads knew how the tree had come to be at the homesite, there were six different responses: plant a seed; plant a seed then transplant the seedling; transplant a wild seedling; buy a seedling; given a seedling; and branch planted. The tree origins are listed in Table IV.20 along with the cases for both the female and male heads of households.

TABLE IV.20

ORIGINS OF TREES
(household heads only)

TREE ORIGIN	FEMALE N=92		MALE N=100		TOTAL N=200	
	freq.	%	freq.	%	freq.	%
Plant a seed then transplant the seedling	32	34.8	47	43.5	79	39.5
Branch planted	18	19.6	20	18.5	38	19.0
Given seedling	16	17.4	13	12.0	29	14.5
Plant a seed	8	8.7	14	13.0	22	11.0
Transplant wild seedling	13	14.1	7	6.5	20	10.0
Buy seedling	5	5.4	7	6.5	12	6.0

The most common way of obtaining a tree, was to plant a seed (39.5%), usually in the garden, and then transplant the seedling to the homesite. There did appear to be some seed selection in place. One respondent explained, "I bought a mango at the market and it was very sweet and juicy. I saved the seed and planted it." Another respondent pointed to a large gum tree with a straight trunk that towered over other trees in the area, "I took some seed from that tree and planted them so I too could have a big pranga (gum tree)."

The second most common method of obtaining a tree (19.0%), was when a branch had been planted and taken root at the homesite. This was normally the case for flowering trees. As well, branches or trunks or small trees, whose primary purpose was to function as a laundry poles often took root and grew. Branches of flowering shrubs and trees had been selected and planted with care in the hopes that they would grow. This did not appear to be the case with the laundry poles which were selected because of their size and functional use.

The third most common method of obtaining a tree that was reported by the household heads (14.5%) was receiving a tree seedling. Two common examples of receiving a tree seedling were those given to school children, or those given to members of tree nursery groups.

When Trees Were Planted

Household heads were asked when the trees at the homesite had been planted. For those that knew when the trees had been planted they were asked the year as well as the time of year when the planting occurred. Time of year was simplified by giving either rainy or dry season. The results of this question are given in Table IV.21.

As Table IV.21 clearly shows, the majority of respondents planted their trees in the rainy season. Almost three quarters of all heads of households said that the trees in the homesite had been planted during the rains. Planting at this time of the year increased chances of survival as the soil moisture content was higher and therefore enabled the tree to establish itself better than in the dry season. Planting during the rainy season also reduced labour expended on tree care as one respondent explains, "I planted the tree during the rains so I would not have to water."

TABLE IV.21

WHEN TREES WERE PLANTED
(household heads only)

TIME OF YEAR	FEMALE N=87		MALE N=95		TOTAL N=182	
	freq.	%	freq.	%	freq.	%
Rainy Season	68	78.2	63	66.3	131	72.0
Dry Season	19	21.8	32	33.7	51	28.0
YEAR:	N=91		N=94		N=190	
<1960	1	1.1	5	5.1	6	3.2
1960-1969	3	3.3	8	8.1	11	5.8
1970-1979	13	14.3	3	3.0	16	8.4
1980-1989	16	17.6	29	29.3	45	23.7
1990	11	12.1	12	12.1	23	12.1
1991	5	5.5	9	9.1	14	7.4
1992	19	20.8	22	22.2	41	21.5
1993	23	25.3	11	11.1	34	17.9

Over half of the trees (58.9%) in the homesite had been planted in the 1990's, while less than 10% of the trees had been planted prior to 1970. Over 80% of the trees had been planted since independence. Understandably, only small numbers of trees were reported to be planted during the war of independence. Yet, no one gave it as a reason why trees were not planted.

Differences between female and male heads of households are small and insignificant. However, it is worth noting that women reported 25.3% cases of trees being planted within the last year compared to 11.1% of men. Men reported 29.3% of their cases of trees being planted during the period between 1980 and 1989.

Who Decided To Plant The Trees

Household heads were asked who in the household had made the decision to plant a tree. The responses were grouped accordingly into the categories of female, male, both females and males, or children. The results are recorded in Table IV.22.

Men appeared to make the decision to plant trees, even in female-headed households. In 47.9% of the cases in female-headed households, and in 91.9% of the cases in male-headed households, men were the ones to decide to plant a tree. This holds true in all groupings except for exotic trees. Women made the decision to plant exotic trees in 48.5% of the cases compared to 41.2% of the cases where men made that decision in female-headed households. This might be due to women having more control of fruit trees.

TABLE IV.22

WHO DECIDED TO PLANT TREES
(household head only)

DECISION MAKER	FEMALE N=96		MALE N=111	
	freq.	%	freq.	%
ALL TREES				
Female	43	44.8	7	6.3
Male	46	47.92	102	91.9
Both	4	4.2	2	1.8
Children	3	3.1		
EXOTIC TREES				
Female	33	48.5	7	7.9
Male	28	41.2	80	91.0
Both	4	5.9	1	1.1
Children	3	4.4		
INDIG. TREES				
Female	10	35.7		
Male	18	64.3	22	95.7
Both			1	4.3
Children				
FRUIT TREES				
Female	27	46.6	3	4.2
Male	28	48.3	67	94.4
Both	2	3.4	1	1.4
Children	1	1.7		
WOOD TREES				
Female	11	40.7	3	10.0
Male	12	44.5	26	86.7
Both	2	7.4	1	3.3
Children	2	7.4		
FLOWERING TREES				
Female	1	50.0	1	20.0
Male	1	50.0	4	80.0
OTHER TREES				
Female	4	44.4		
Male	5	66.6	5	100.0

Significant Chi-Squares resulted between female and male-headed households with respect to who decided to plant the tree. Chi-squares significant at <0.01 occurred in the groupings of all trees, exotic and indigenous trees, and fruit and wood trees with men dominating the decision making process.

Who Planted and Cared for The Trees

One of the objectives of this research was to look at the effort involved in planting and caring for trees. Questions were asked to determine not only who planted the tree, but also what sort of care was provided for the tree and by whom. With respect to care, the actions of watering, weeding and fencing the tree were of prime interest.

For the questions pertaining to the activities of planting, watering, weeding, and fencing, a small number of responses indicated that women and children, or men and children had carried out the activities. In such cases, the response was coded as "both" as children of the older heads of households were adults.

Planted

The responses to the question who planted the tree are summarized in Table IV.23. It appears that in general, men did the planting in significantly more cases in both female and male headed households ($p<0.01$). In 51% of the cases in female-headed households men planted the trees compared to 36% of the women. In male headed households women planted trees in only 8% of the cases compared to men planting in 84.6% of the cases. This observation held true for all categories of trees although it was significant only for exotic and fruit trees ($p<0.01$), and for indigenous

TABLE IV.23

WHO PLANTED THE TREES
(household head only)

WHO PLANTED	FEMALE N=96		MALE N=110	
	freq.	%	freq.	%
ALL TREES				
Female	35	36.4	9	8.2
Male	49	51.0	93	84.6
Both	6	6.3	5	4.5
Children	6	6.3	3	2.7
EXOTIC TREES				
Female	27	39.7	8	9.2
Male	29	42.7	74	85.1
Both	6	8.8	3	3.4
Children	6	8.8	2	2.3
INDIG. TREES				
Female	8	28.6	1	4.3
Male	20	71.4	19	82.7
Both			2	8.7
Children			1	4.3
FRUIT TREES				
Female	24	41.4	5	7.0
Male	27	46.6	60	84.5
Both	5	8.6	4	5.7
Children	2	3.4	2	2.8
WOOD TREES				
Female	7	25.9	3	10.3
Male	15	55.6	24	82.7
Both	1	3.7	1	3.5
Children	4	14.8	1	3.5
FLOWERING TREES				
Female	1	50.0	1	20.0
Male	1	50.0	4	80.0
OTHER TREES				
Female	3	33.3		
Male	6	66.7	5	100.0

trees ($p < 0.05$). This could reflect a gendered division of labour.

Children did plant trees in 9 cases, 6 of the cases occurred in female-headed households. Generally these trees were trees that the children had received at school as this mother's comment illustrates, "The school gave that pranga (gum tree) to my son. It's his, so he planted it."

Watered

Table IV.24 summarizes the findings about who watered the trees. It must be noted that generally trees did not get watered. A number of respondents said that trees were not watered, then they would correct themselves and say that trees were watered when they were planted. Or in the words of one respondent "I watered the tree when I put it there (on the homesite) and then the rains watered it." One woman explained why an indigenous tree whose branch had been planted at the homesite was not watered, "No, this was not watered as it is from the forest. It is watered by God." Sometimes a tree was close to where the dishes were washed and the water would be thrown in the direction of the tree, this was considered watering. One male household head explained differential treatment for his trees when it came to watering, "You do not need to water jacaranda or pranga after transplanting, but you need to water lemon."

Women did the watering of trees in female-headed households in 44.5% of the cases. Women shared the task with men in female-headed households in 34.9% of the cases. In male-headed households the task was shared with both the men and the women watering the trees in 37.5% of the cases and only men watering in 25% of the cases.

TABLE IV.24

WHO WATERED THE TREES
(household heads only)

WHO WATERED	FEMALE N=63		MALE N=64	
	freq.	%	freq.	%
ALL TREES				
Female	28	44.5	11	17.2
Male	7	11.1	16	25.0
Both	22	34.9	24	37.5
Children	6	9.5	13	20.3
EXOTIC TREES				
Female	25	48.1	10	17.5
Male	5	9.6	14	24.6
Both	17	32.7	22	38.3
Children	5	9.6	11	19.3
INDIG. TREES				
Female	3	27.3	1	14.2
Male	2	18.2	2	28.6
Both	5	45.4	2	28.6
Children	1	9.1	2	28.6
FRUIT TREES				
Female	24	50.0	8	16.3
Male	5	10.4	9	18.4
Both	16	33.3	21	42.9
Children	3	6.3	11	22.4
WOOD TREES				
Female	2	18.2	1	9.1
Male	2	18.2	5	45.4
Both	4	36.3	3	27.3
Children	3	27.3	2	18.2
FLOWERING TREES				
Female	2	100.0	2	66.7
Male			1	33.3
OTHER TREES				
Female				
Male			1	100.0
Both	2	100.0		

The differences between female and male household heads for the groupings of all trees, exotic and fruit trees had Pearson chi-squares that were significant at <0.01 in favour of the woman doing most of the watering of the trees.

Weeded

When asked about weeding of trees the differences between female and male-headed households are again significant. Men reported doing the majority of the weeding in male-headed households (46.8%). On the other hand, women reported splitting the weeding equally between women (41.5%) and both women and men (41.6%). The responses to the question regarding who in the household weeded the trees are summarized in Table IV.25.

The differences between female and male household heads for the groupings of all trees, exotic and fruit trees had Pearson chi-square values significant at <0.001. The groupings of indigenous, wood and other trees were significant at <0.05.

It was thought that children might be more involved in the weeding and watering of trees. Yet as the figures in Table IV.25 indicate, this was not generally the case. Children did weeding or watering in 20% or less of the cases. When asked about childrens' involvement in tree care, this response given by a female household head was typical, "I did the weeding and watering as the children were in school." When talking to TNG members about the care of their trees, TNG members stressed that children could not be trusted to do the work required to care for the trees. The TNG members, all adults, did the work themselves.

TABLE IV.25

WHO WEEDED THE TREES
(household head only)

WHO WEEDED	FEMALE N=65		MALE N=79	
	freq.	%	freq.	%
ALL TREES				
Female	27	41.5	15	19.0
Male	5	7.7	37	46.8
Both	27	41.6	14	17.7
Children	6	9.2	13	16.5
EXOTIC TREES				
Female	24	48.0	13	19.1
Male	4	8.0	32	47.1
Both	17	34.0	12	17.6
Children	5	10.0	11	16.2
INDIG. TREES				
Female	3	20.0	2	18.2
Male	1	6.7	5	45.4
Both	10	66.7	2	18.2
Children	1	6.6	2	18.2
FRUIT TREES				
Female	25	54.4	10	18.2
Male	1	2.2	21	38.2
Both	18	39.1	13	23.6
Children	2	4.3	11	20.0
WOOD TREES				
Female	1	7.1	2	11.8
Male	3	21.4	12	70.6
Both	6	42.9	1	5.9
Children	4	28.6	2	11.7
FLOWERING TREES				
Female	1	50.0	2	50.0
Male	1	50.0	2	50.0
OTHER TREES				
Female			1	33.3
Male			2	66.7
Both	3	100.0		

Fenced

Fencing of tree seedlings often meant the difference between seedling survival and the tree becoming goat or cattle fodder. Respondents were taken at their word regarding fencing as they were with other questions. However, what was considered a fence was often not a structure that would deter herbivores. Nonetheless, these structures, visible or not were recorded.

Only one household head, a female, indicated that someone from outside the household had been hired to build fences around her trees. As the object was to look at who was doing the tasks within the household, that case is not included in the analysis.

The responses to the question regarding who in the household fenced the trees are summarized in Table IV.26. Men did significantly more of the fencing in both female-headed households (69.6%) and male-headed households (87.7%) for all trees. This reflects a traditional division of labour among the Shona peoples.

The differences between female and male household heads had Pearson chi-square values that were significant at <0.05 for the groupings of all trees, exotic, and fruit trees. However, note that for female-headed households N is only 46 cases. The majority of trees were not fenced.

TABLE IV.26

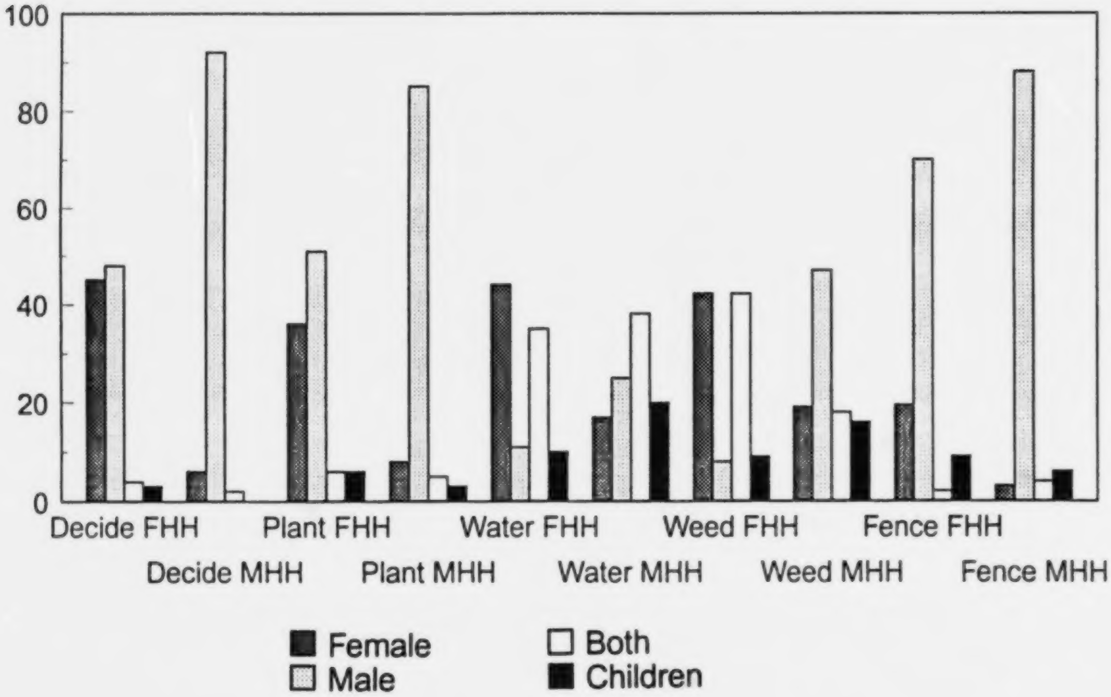
WHO FENCED THE TREES
(household head only)

WHO FENCED	FEMALE N=46		MALE N=73	
	freq.	%	freq.	%
ALL TREES				
Female	9	19.5	2	2.7
Male	32	69.6	64	87.7
Both	1	2.2	3	4.1
Children	4	8.7	4	5.5
EXOTIC TREES				
Female	9	23.7	2	3.2
Male	24	63.2	56	90.4
Both	1	2.6	2	3.2
Children	4	10.5	2	3.2
INDIG. TREES				
Female				
Male	8	100.0	8	72.8
Both			1	9.0
Children			2	18.2
FRUIT TREES				
Female	9	23.7	2	3.6
Male	25	65.8	48	85.7
Both	1	2.6	3	5.4
Children	3	7.9	3	5.3
WOOD TREES				
Female				
Male	3	75.0	12	100.0
Both				
Children	1	25.0		
FLOWERING TREES				
Female				
Male	2	100.0	3	100.0
OTHER TREES				
Female				
Male	2	100.0	1	50.0
Children			1	50.0

seedlings in female-headed households while male-headed households reported that both women and men did the majority of the watering. With weeding, the division of labour was also not clearly allotted to either men or women. In female-headed households it was reported that women, and both women and men, did equal amounts of weeding of tree seedlings. However, in male-headed households, men did the bulk of the weeding.

FIGURE IV.4

CARE AND MAINTENANCE OF HOMESITE TREES



When interpreting Figure IV.4 it is important to keep in mind that the numbers do not indicate the care that took place for all homesite trees, rather the graphs show when trees were cared for who was responsible for the maintenance activities. For example, trees were fenced in less than 50% of the cases in female-headed households.

As well, while the tables and graphs indicate that weeding and watering of trees took place it does not reflect the number of times these activities took place. Respondents comments and researcher observations suggest that these activities were infrequent.

One woman's response to a question posed to her comparing the amount of work involved with trees verses crops offered a insight into perceptions about the care of trees,

> No, trees are not much work. Just a bit of work to plant them, but I didn't plant all in one day. Only need to plant once and they grow fruit for many years. With crops you must plant them every year.

A final comparison was made by an old widow who shared this thought on trees during a focus group,

> Trees are like children. They take time to grow and be useful. You have to take care of them when they are young and when they grow up they give you money.

Personal Use

Respondents were asked about the ways they personally used the trees that had been planted in the homesite. Many of the trees were recently planted, yet some respondents gave ways in which they used the tree. It is safe to assume that some of the responses were therefore hypothetical and instead of reflecting how the tree is currently used, reflect how they intend to use the tree in the future. Table IV.27 records the number of cases in which a tree is used for various purposes. It is possible for a tree to be used for more than one purpose.

TABLE IV.27

PERSONAL USE OF THE TREES BY HOUSEHOLD HEADS

USE	FEMALE N=112		MALE N=150		TOTAL N=262
	freq.	%	freq.	%	
Shade	38	40.4	56	59.6	94
Fruit	19	34.5	36	65.5	55
Fodder	11	40.7	16	59.3	27
Firewood	10	47.6	11	52.4	21
Laundry Post	10	52.6	9	47.4	19
Medicines	11	61.1	7	38.9	18
Poles	10	55.6	8	44.4	18
Flowers	2	33.3	4	66.7	6
Hhld Implements			2	100.0	2
Farm Implements			1	100.0	1
Planks	1	100.0			1

The most common use of household trees for both women and men was for shade. In 94 of the cases trees were used for shade. The second most reported use of household trees was for fruit (N=55). Heads of both male and female-headed households gave fruit as one of the ways they personally used trees in their households. Male headed households reported using fruit from trees more than female-headed households, 65.5% verses 34.5% of the reported cases. The third most common way that household trees were used was for fodder. In 27 of the cases household heads reported that trees were used to provide fodder for animals. There was no indication of how much fodder the trees provided.

There were no significant differences between female and male-heads of households with respect to personal use of the trees.

Sale of Fruit

Only one respondent sold any tree products other than fruit. The respondent was the 26 year old son in a male-headed household that sold gum trees for poles. All other respondents indicated only having sold fruit from their trees. Some respondents indicated that they might sell their gum trees for poles when they were bigger, if they didn't need them for their own use. Therefore, the rest of the discussion is limited to the selling of fruit from the fruit trees.

Table IV.28 records the number of cases in which heads of households reported having trees from which they sold fruit. The other household members' responses are also included in this table.

TABLE IV.28

SELLING OF FRUIT FROM FRUIT TREES

TREE TYPE	HOUSEHOLD HEADS		OTHERS		TOTAL
	FEMALE N=10	MALE N=5	FEMALE N=7	MALE N=23	
Exotic	10	5	6	18	39
Indigenous			1	5	6

Fruit from exotic trees were what was sold in the majority of cases. According to the heads of households, fruit from exotic trees was the only fruit that was sold. Others [illegible]usehold did not always agree with this statement. There were six cases where household members other than the head indicated that fruit from indigenous homesite trees had been sold. It is interesting that the number of cases of men reporting fruit being sold by other household members is higher than that reported by other household females.

Authority To Use Or Sell The Fruit

Table IV.29 summarizes the responses to the question who gives the authority to use the tree or sell its products. The differences between female and male-headed households have Pearson chi-square values which are significant at $p<0.01$ for all groupings except for OTHER trees. The household head was generally the one who gave authority to use a tree or to sell its products. In female-headed households, women had the authority in these matters in 68.6% of the cases. In male-headed households, men had the authority in 89.4% of the cases. Men were much more likely to have authority in female-headed households (25.4%) compared to women in male-headed households (3.5% of the cases). Whether the tree was exotic or indigenous, or a fruit, wood, or other tree, the general findings remain the same.

The wife in a male-headed household explained the question of authority regarding tree use in her household. "My husband has the authority to sell the pranga (gum tree). If someone wants planks, I need to talk to my husband and if he says so, then I can sell it. He decides everything for the gum trees." She went on to explain about the papaws. "I sell papaws to small-scale farmers because they don't have papaw trees. I make the decision and sell. We both share the money from the papaws."

TABLE IV.29

AUTHORITY TO USE OR SELL THE TREES AND THEIR PRODUCTS
(household heads only)

WHOSE AUTHORITY	FEMALE N=67		MALE N=85	
	freq.	%	freq.	%
ALL TREES				
Female	46	68.6	3	3.5
Male	17	25.4	76	89.4
Both	4	6.0	6	7.1
EXOTIC TREES				
Female	39	70.9	3	4.2
Male	13	23.6	65	9.3
Both	3	5.5	4	5.5
INDIG. TREES				
Female	7	58.4		
Male	4	33.3	11	84.6
Both	1	8.3	2	15.4
FRUIT TREES				
Female	36	76.6	3	4.8
Male	9	19.1	54	85.7
Both	2	4.3	6	9.5
WOOD TREES				
Female	8	47.0		
Male	7	41.2	21	100.0
Both	2	11.8		
OTHER TREES				
Female	2	66.7		
Male	1	33.3	1	100.0

Another wife, approximately 45 years old, said "I am the owner of the trees" when referring to two papaws. She continued, "My husband is always ill so I am the one who sells the fruit. We both share the money."

Not all fruit that grew was sold. Who then gave the authority to use the fruit? This question reflects both sold and unsold fruit, but often respondents said that no authority was needed to eat the fruit.

Who Decided When And Where To Sell, And Who Sold The Fruit

In this section the decision making process regarding the sale of fruit is briefly looked at. Once again, be aware that the number of cases where fruit was sold is not very large. There were two cases where the head of the household indicated that women and children had actually sold the fruit, these responses were coded as BOTH, both men and women were involved in the task or decision making.

When

With respect to who decides when to sell or use the fruit or products from the trees, it appears that household heads hold the authority in this matter. As can be seen in Table IV.30, in 65.6% of the cases in female-headed households women decide, while in male-headed households men decide 76.3% of the time. The differences between the two types of household heads was significantly different with a Pearson Chi-square significant at $p<0.1$ for the grouping of all trees, exotic, fruit, and wood trees. A female household head gave the following response that was commonly heard from household heads, "When I see the fruit is ready I eat it. If there is lots of fruit, I sell it."

TABLE IV.30

WHO DECIDES WHEN TO SELL OR USE TREES &/OR THEIR PRODUCTS
(household heads only)

WHO DECIDES	FEMALE N=32		MALE N=38	
	freq.	%	freq.	%
ALL TREES				
Female	21	65.6	3	7.9
Male	6	18.8	29	76.3
Both	4	12.5	6	15.8
Children	1	3.1		
EXOTIC TREES				
Female	20	69.0	3	8.8
Male	5	17.3	25	73.5
Both	3	10.3	6	17.7
Children	1	3.4		
INDIG. TREES				
Female	1	33.3		
Male	1	33.3	4	100.0
Both	1	33.4		
Children				
FRUIT TREES				
Female	15	62.5	3	11.1
Male	5	20.8	20	74.1
Both	3	12.5	4	14.8
Children	1	4.2		
WOOD TREES				
Female	6	75.0		
Male	1	12.5	9	81.8
Both	1	12.5	2	18.2

Where

When determining where the fruit would be sold, household heads once again had the authority. Table IV.31 shows that in the majority of the cases in both female-headed households (71.9%) and male-headed households (36.9%) females, and males respectively decide where the fruit will be sold.

Fruit, like vegetables, was observed being sold by the sides of the road, being taken into the township of Mushimbo, or being carried around the Ward. It is in the selling of the fruit where it is possible to see the involvement of children. In male-headed households children decided where to sell the fruit in 28.9% of the cases. Once again the differences between the two types of households is significant at <0.01 for Pearson chi-square analysis for the groupings of all trees, exotic, fruit and wood trees.

Who Sells

Once again the differences between female and male-headed households is significant. Table IV.32 records the breakdown by type of household of who sells the trees and/or their fruits. In female-headed households, women are the ones who sell the fruit in 71.9% of the cases. Men are less involved in sales in their own households, only selling in 23.1% of the cases. It is in male-headed households that children do the majority of the selling of fruit. Children are responsible for selling the fruit in 35.9% of the cases in male households. There were significant differences between female and male-headed households for the groupings of all trees, exotic, fruit, and wood trees.

Children were observed selling fruit at the schools. One girl in primary school brought oranges to school to sell to the teachers. Another girl in secondary school

TABLE IV.31

WHO DECIDES WHERE TO SELL THE TREES &/OR THEIR PRODUCTS
(household heads only)

WHO DECIDES	FEMALE N=32		MALE N=38	
	freq.	%	freq.	%
ALL TREES				
Female	23	71.9	2	5.3
Male	6	18.7	14	36.9
Both	3	9.4	11	28.9
Children			11	28.9
EXOTIC TREES				
Female	22	75.9	2	5.9
Male	5	17.2	12	35.3
Both	2	6.9	10	29.4
Children			10	29.4
INDIG. TREES				
Female	1	33.3		
Male	1	33.3	2	50.0
Both	1	33.4	1	25.0
Children			1	25.0
FRUIT TREES				
Female	17	70.8	2	7.4
Male	5	20.8	9	33.3
Both	2	8.4	7	26.0
Children			9	33.3
WOOD TREES				
Female	6	75.0		
Male	1	12.5	5	45.4
Both	1	12.5	4	36.4
Children			2	18.2

TABLE IV.32

WHO SELLS THE TREES &/OR THEIR PRODUCTS
(household heads only)

WHO SELLS	FEMALE N=32		MALE N=39	
	freq.	%	freq.	%
ALL TREES				
Female	23	71.9	6	15.4
Male	2	6.3	9	23.1
Both	6	18.7	10	25.6
Children	1	3.1	14	35.9
EXOTIC TREES				
Female	22	75.9	5	14.3
Male	2	6.9	8	22.9
Both	4	13.8	9	25.7
Children	1	3.4	13	37.1
INDIG. TREES				
Female	1	33.3	1	25.0
Male			1	25.0
Both	2	66.7	1	25.0
Children			1	25.0
FRUIT TREES				
Female	17	70.8	5	17.8
Male	1	4.2	1	3.6
Both	5	20.8	10	35.7
Children	1	4.2	12	42.9
WOOD TREES				
Female	6	75.0	1	9.1
Male	1	12.5	8	72.7
Both	1	12.5		
Children			2	18.2

brought lemons to school to sell to the teachers. For households that sold fruit in Harare at Mbare Msika, the main marketplace for the country, adults would make the long bus trip to Harare to sell the fruit.

Proceeds From The Sales

The recipients of the proceeds from the sale of fruit were significantly different between female and male-headed households. Women receive the proceeds in their own households (68.8%), while in male-headed households the proceeds appear to be shared more between the both the male and the female, (79.5%) of the cases. As can be seen in Table IV.33, this trend continued for both exotic and indigenous trees and for both fruit and wood trees. While children are involved in the sale of the fruit, they are not the ones to receive the money from the sales. Significant Pearson chi-square figures were obtained for the groupings of all trees, exotic, fruit, and wood trees that indicated differences between female and male-headed households ($p<0.05$).

One wife described the dispersement of money earned from selling fruit with the statement, "I sell the fruit (from the mango tree). If he (husband) asks for the money I give him some of it." A male household head explained that in his household, the mangos he and his wife sold came from trees his parents had planted. His parents were old now so he would give them some of the money that the mangos earned. A 60 year old male household head had the following to say about who gets the money from fruit sales:

> With mango when I sell the fruit I give her (his wife) some money. When she sells she gives me some money. But the guava and muhange, I don't care about that. She can keep the money because I am the one who eats the money.

TABLE IV.33

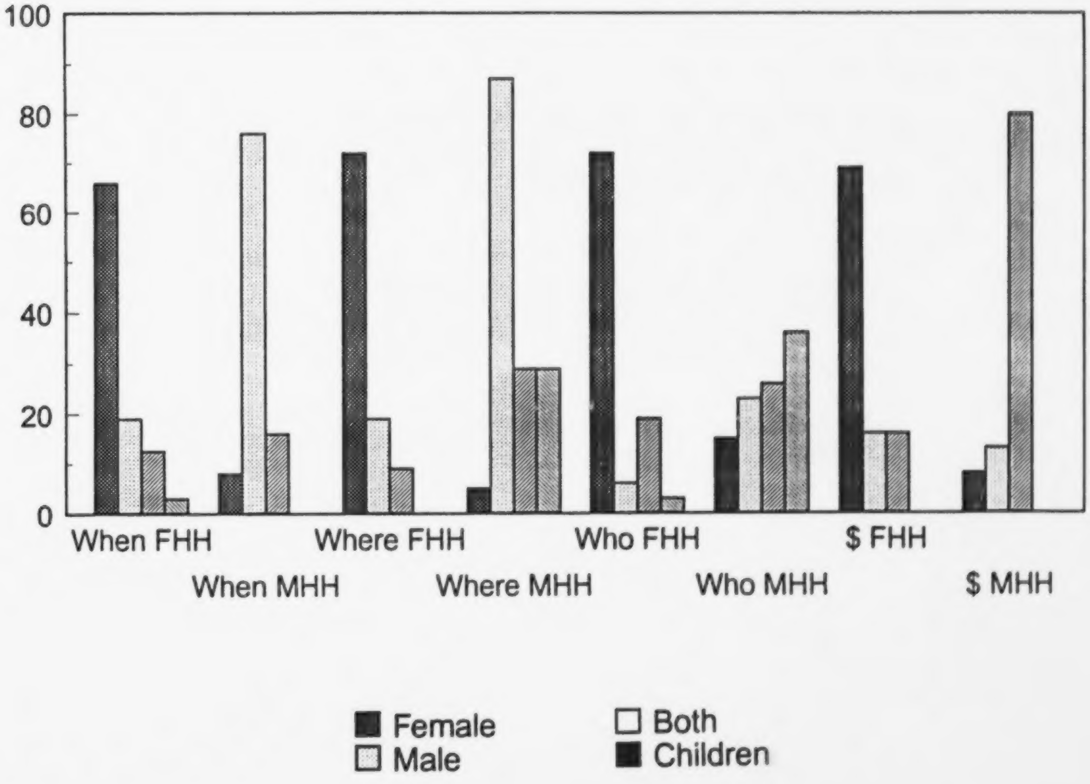
WHO RECEIVES PROCEEDS FROM THE SALE OF FRUIT
(household heads only)

WHO RECEIVES PROCEEDS	FEMALE N=32		MALE N=39	
	freq.	%	freq.	%
ALL TREES				
Female	22	68.8	3	7.7
Male	5	15.6	5	12.8
Both	5	15.6	31	79.5
EXOTIC TREES				
Female	21	72.4	3	8.6
Male	4	13.8	4	11.4
Both	4	13.8	28	80.0
INDIG. TREES				
Female	1	33.3		
Male	1	33.3	1	25.0
Both	1	33.4	3	75.0
FRUIT TREES				
Female	17	70.8	2	7.1
Male	4	16.7	1	3.6
Both	3	12.5	25	89.3
WOOD TREES				
Female	5	62.5	1	9.1
Male	1	12.5	4	36.4
Both	2	25.0	6	54.5

Figure IV.5 illustrates the differences between female-headed households and male-headed households with respect to deciding when, where, and who sells fruit, as well as who actually gets the money from the sale of fruit from homesite trees. Once again it is possible to note some striking differences between the two types of households. In determining when and where fruit is sold, the heads of household dominate the decision making process; females in female-headed households and males in male-headed households. When it comes to the actual selling of fruit, female household heads reported that women did most of the selling, while male household heads reported that children did most of the selling. When the money gained from selling of fruit was divided up, there were also differences between the household types: in female-headed households, women kept the money, while in male-headed households the money was shared between both the men and women.

FIGURE IV.5

SELLING OF FRUIT



Summary

This completes the reporting of the results of this study. The characteristics of the respondents and the setting in which they live and work have been described. The people in Nyapfura VIDCO are subsistence farmers who do their cooking over wood fires. The average number of years of education was slightly greater than four and less than half the respondents had spoken to an extension agent. Approximately half of the households in the VIDCO are female-headed, as it is common for men to work in the urban areas. Households often rely on remittances from family and relatives working elsewhere as well as their own income generating activities to feed, clothe, and school their families. Over 85% of the respondents felt they had enough land to feed their families.

It was within this setting that respondents' attitudes towards trees, based on a number of questions, were reported. These questions included: is it important to plant trees and why; past and present comparisons regarding the availability of trees; and what species of trees respondents would like the government to give them. Finally, the actual maintenance and use of trees planted on the homesite was summarized.

All but one respondent felt it was important to plant trees and over 75% of respondents had personally planted a tree in their lifetime. Most respondents believed that it took more time to collect firewood now that most trees planted in Nyapfura VIDCO were grown for fruit, rather than for firewood. The homesite was said to be the preferred site to plant a free seedling, as trees could be better cared for and protected there.

When it came to the actual maintenance and use of the trees planted at the homesite, there were distinct differences between female and male-headed households. Men tended to be the person who decided to plant the trees in the majority of cases in both types of households. Men also tended to do the tree planting and fencing in both types of households. Women played a much more active role in the watering and weeding of trees doing the bulk of it in female-headed households, and sharing the task with men in male-headed households. Household heads dominated the activities and decision making involved with selling the fruit.

The next chapter will discuss the findings of this study in relation to the literature reviewed in Chapter II.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

Introduction

Africa is one region of the world that people think of when the topics of deforestation, desertification, and overpopulation arise. Whether one believes that Zimbabwe is a country with a deforestation problem or a country with sufficient woodlands to meet the needs of its rural people, it is acknowledged that population pressures are increasing the demand for natural resources. Trees planted or protected in homesites comprise a small but important component of the tree resources in Zimbabwe. Many households in rural Zimbabwe are encouraging natural regeneration, planting and replanting trees, both indigenous and exotic.

Gender is a vital component in the issue of tree planting. All too often in forestry issues gender is overlooked, with women and men considered to have the same involvement in the planting, maintenance and use of trees. Such an approach gives a distorted view, especially in a country such as Zimbabwe with a high proportion of female-headed households. As well, women generally are the ones responsible for providing the household with firewood. Loss of tree cover or access to trees that provide firewood have serious implications for women and, hence, the household. If women must spend more time searching for firewood, their labour is diverted away from agriculture and other activities such as food preparation, and child care that provide for the household. This has a negative impact on the household.

Research is ongoing in Zimbabwe to address the issue of the value of trees and to assess the effectiveness of tree planting activities. This study adds to this knowledge, and explores the differentiation between female and male-headed households with respect to their tree planting and maintenance behaviour.

In order to gain a better insight into these issues, this study undertook a detailed qualitative and quantitative study of four villages in Nyapfura VIDCO, Nyahunure Ward, Mutoko Communal Area, Zimbabwe. The main objective of the study was to examine rural Zimbabweans' valuation of trees as exhibited by the planting and maintenance of tree seedlings on the homesite, taking into account the presence or absence of a male as the head of the household. Chapter II reviews some of the elements that affect tree planting in Zimbabwe and gives working definitions of the terms and concepts that formed the groundwork for this study.

To obtain the information needed to meet the objective of the study it was necessary to observe and talk to the farmers in Nyahunure Ward. To this end, in-depth interviews and participant observations were combined with detailed questionnaires. The data collection was carried out in Nyapfura VIDCO, one of the six VIDCOs in Nyahunure Ward. The four villages within the VIDCO were considered to be homogenous in terms of relative wealth and agricultural assets. Purposive and quota sampling were used to ensure that both female and male-headed households were represented in all four villages.

The detailed data obtained from this study are discussed in Chapter IV.

Summary of Findings

The socio-economic portion of this study provides evidence that the people of Nyahunure Ward are subsistence farmers. This is exemplified by the small landholdings supporting a relatively high number of people; mean landholdings were 5.7 acres for a mean household of seven people. Running water and electricity were not available in the ward. The collection of water and firewood were daily activities for all households in the research site. Livestock is often an indicator of wealth, and the small numbers of cattle, goats, and other animals along with limited, basic farming implements reinforce the fact that these farmers were not wealthy and that much of their day is spent on activities that are essential if the household is to eat.

To supplement the limited income generated by farming, the people in Nyahunure Ward relied on off-farm income. Remittances sent by family members working elsewhere were valuable sources of income for over half of the households. Most households also participated in income generating activities such as providing casual labour, brewing beer, building bricks, or selling crafts. These activities were important to both female and male-headed households.

There were some obvious gender differences that became apparent on the basis of the socio-economic data. Many of the adult men in the area had left Nyahunure in search of work. This skewed the population so that there were more female household heads than male household heads as was shown in Table IV.1. Education levels tended to be low, but women fared less well than men, having a mean of 3.6 years of education compared to men's 5.2 years. Men had more contact with extension services than women. They were more likely to have spoken to an extension officer, attended a farmers day, belong to ADA, and belong to a farm group. More women than men belong to a savings club and/or a tree nursery group. These gender differences are supported by the literature reviewed in Chapter II (Chimedza, 1988; Govaerts, 1987).

This study found that trees are being planted in Nyahunure Ward, with some 77% of the sample population having planted one or more trees. This figure translates into 87% of households having planted trees which is higher than the figures reported by Du Toit et al. (1984) and Grundy et al. (1993), but similar to the 82% findings of Fortmann and Nabane (1992a) and the 90% finding of Price (1994). A significant amount of tree planting in the survey area had taken place within the past five years. Looking at the tree planting activities reported in the literature, this could indicate a trend towards more tree planting.

One of the questions this study raised was whether there are differences between female and male households with respect to their tree planting. Studying the data presented in Table IV.10, striking differences between the genders is evident. Significantly more men than women had planted trees. Also apparent from Table IV.10 is that more men than women had homesite trees they planted die. This raises the question, do women provide better care for the trees they plant than men provide?

Care

This study examined the activities that were undertaken to plant and nurture seedlings in home compounds. While the researcher was not present for a full year of observation, it was suggested in interviews and from participant observation that planting trees at the homesite takes very little time. Tree planting activities with tree nursery groups appeared to be much more time consuming due to group dynamics. However, tree planting at the homesite was usually a matter of transplanting a seedling from the garden, placing the seedling in a small hole, possibly with manure or leaf litter, and adding water.

Homesites provide a safe tenurial location in which trees can be planted and protected. However, there are disincentives to planting at the homesite. There is insufficient water at the homesite and trees needed to be watered. Watering of tree seedlings was reported and was observed. Water collection was time consuming, with water sources being on average, 13 minutes distant. However, trees were usually watered only in the first year or two, unless the tree happened to be close to where the household bathed or washed dishes. While weeding of tree seedlings was reported, it was never observed. However, vegetative growth was not observed around homesite trees either. Homesites were generally very dry and there was not much in the way of vegetative growth. Water being a limiting factor on the homesites, tree survival was bound to be higher if the seedling was not competing with weeds for water.

Another disincentive for planting trees at the homesite was the lack of fencing. While gardens are often fenced, homesites were not. Fencing appeared to be the most critical activity to establish a tree seedling. Browse damage by animals was the most common reason reported for tree seedling mortality. Constructing proper fencing was time consuming. Sturdy branches and bark string needed to be collected from the woodlands and then constructed into a fence around the seedling. While some households had made an effort to erect fences around tree seedlings, these generally were not effective in preventing the seedling from becoming fodder. While some seedlings managed to survive animal browsing, their growth rate was affected and the tree was more susceptible to disease. When there were no fences, household members tended to shoo animals away from trees. The time involved in this was not calculated.

There were considerable gender differences in tree care between female-headed households and male-headed households. As in the activities of planting trees, fencing of trees was dominated by men, even in female-headed households. Women were more active in watering trees in female-headed households. In male-headed households they shared this task with men. Weeding was reported to be shared between both men and women in male-headed households, while women did more weeding in female-headed households. It appears that women are more involved in the ongoing care of trees, while men tend to be more involved with the one-time-only activity of planting or fencing a tree.

In general, people felt that trees did not involve much effort. It was agreed that trees were much less work than crops and provided for the household for many years, while a crop lasted for only one growing season. In fact, respondents indicated that they would like to learn more about tree planting and care so they could plant more trees. The gender differences in exposure to extension services favour men in this regard. However, the forestry commission extension officer has such a large area to cover that the chances of either women or men meeting with him are slight. The AGRITEX officer is slightly more accessible to residents in the research area, but training related to silviculture is minimal. Greater access to better information is needed for both extension agents as well as the farmers. It must be noted that all the federal extension agents in the area were male, a possible disincentive to women who wished to learn more about trees (Fortmann and Rocheleau, 1985; Seito & Weidemann, 1990).

Cost

In addition to the time involved with planting and caring for homesite trees, this study looked at cost as a factor that might prevent households from planting or maintaining trees. The results in Table IV.11 indicate that few households incurred any expenses related to their trees. A small number of respondents had purchased tree seedlings, with significantly more men buying seedlings than women. Even fewer respondents reported using fertilizer on trees, and only two had used pesticides. Both fertilizer and pesticides were valuable commodities, and the application of these is indicative of the perceived value of trees.

From the number of trees planted at homesites and the low numbers of respondents who purchased seedlings or products to care for the trees, one can conclude that in general, no money was required to successfully plant and grow trees at the homesite. It is possible that trees would be more productive if higher quality seedlings were purchased, or trees were fenced, fertilized and treated against pests. While more men than women had purchased tree seedlings, cost of tree care did not appear to be a greater disincentive to female-headed households than male-headed households when it came to planting trees. It is possible for households at any level of income to grow productive trees, as some of the Zimbabwean literature indicates (Campbell, Vermeulen & Lynam, 1991; Du Toit et al., 1984; Fortmann and Nabane, 1992a; Price, 1994).

Rewards

Data from this study show that people have a bias towards planting trees with a good market value. The trees that have been planted and the trees that respondents would like to receive to plant are generally multipurpose, fruit-bearing trees. This finding agrees with other Zimbabwean literature regarding tree planting and use (Clarke, 1991; Dewees, 1992; Du Toit et al., 1984).

The study discovered significant differences in the events related to selling tree products. Household heads dominate the decision making process in determining who can use the produce. Household heads, be they female or male, are generally the ones who decide when and where to sell tree produce. The actual activity of selling the fruit was less clear, with females doing most of the selling in female-headed households, and men sharing the task with women and children in male-headed households.

Even more important is who receives the proceeds from the sale of tree products. In this study the trend was towards women keeping the money in female-headed households, while male-headed households reportedly tended to share the money between both men and women. Who benefits from the labour involved with planting, caring, and selling of trees is a crucial point. If women do not perceive any benefits from trees they are less likely to plant or care for them. As Marilyn Hoskins notes:

> where men plant and women perform the maintenance tasks, the trees that men agree to plant will certainly die if the women have no interest, time or perception of the real benefits to come from their input.
> (Hoskins, 1979:5)

While the produce from trees planted in the homesite is secure from theft, this does not ensure that the respondents would always have access to the trees they had planted. Access to planted trees did not appear to be an issue for men; however, a number of respondents in this study reported losing access to their trees after being widowed or divorced. This issue was not explored in depth, but the number of respondents in this situation support the literature that suggests this is a disincentive to women's tree planting activities. This reflects the patrilocal tradition and the custom that widows or divorcees return to their families of origin.

Overall, trees are being planted and cared for in both female- and male-headed households. This reflects a valuation of trees, particularly under circumstances of multiple daily demands for labour competing for the energy of both women and men. There are some differences between the two types of households regarding who is actually involved in the tasks associated with trees, but in general trees are reported to be valued. While many of the trees planted died, farmers in the area tended to compensate for the high tree mortality by planting more trees initially and by continuing to plant trees.

Recommendations

Presently, seedlings for only a few species are available from the forestry commission, almost all of which are exotic. The tree nursery groups in the research area were planting only eucalyptus, jacaranda and papaw trees. People in this study have indicated they would also like to plant more indigenous seedlings. Especially if fuelwood becomes less abundant, indigenous fuelwood species should be made available, the people of Nyahunure Ward reported preferring indigenous trees over eucalyptus for fuel.

More important than providing a wider selection of tree species to chose from is providing farmers with better information about planting and growing trees. While much is known about the silviculture of eucalyptus, it does not meet the many needs for tree products expressed by women and men in rural Zimbabwe. The researcher was asked various questions related to silviculture, germination, and propagation of both exotic and indigenous trees. Silvicultural techniques for seed selection, growing, and pruning are all needed at the local level for both exotic and indigenous trees. There needs to be a way to facilitate the ongoing planting, as well as to provide information on the most sustainable way to harvest. Obviously, trained extension agents are also needed to pass on this information to farmers in the rural areas. Respondents in this study were constantly looking for information that would help them. There is clearly a willingness to learn.

Less attention should be paid to the eucalyptus tree. Eucalyptus are the major source of construction wood, but this is only one of many uses of trees and does not address the real needs of the rural people. Eucalyptus species are generally not considered very good for fuelwood. A multipurpose tree that would provide fruit, fodder, fuelwood and construction wood would be more beneficial. This study saw situations where tree nursery groups were given seeds that they either didn't plant, or planted in a nursery and never transplanted to woodlots or given to members to plant on their land. If seeds are going to be given away, more benefit will be realized if the seeds for species that are in demand are made available.

An effort also needs to be made to persuade farmers that they have the knowledge and facilities to plant and care for trees. It was noted while interviewing farmers that they believed that special training and products were necessary to successfully grow trees. Polythene pockets were provided to tree nursery groups to germinate seeds and establish seedlings. It was not possible to discover people's attitudes towards these pockets prior to the establishment of tree nursery groups, but many farmers now say they cannot grow trees without having pockets. Farmers' use of the local indigenous knowledge and materials should be promoted, and this reliance on external support discouraged.

If tree planting on the homesite is to be encouraged to increase tree cover in the communal areas, tree tenure for these planted trees, in the homesite as well as other landholdings, will need to be more clearly defined. Throughout the course of research, respondents indicated a fear of having fruit stolen. A means of enforcing individual rights to produce is needed to reduce this fear and encourage tree planting. As well, tenure rights need to be established for women so that if a woman becomes widowed or divorced, she still has access to trees on her former husband's land.

Significance of the Study

This study accomplished a sociologically based assessment of the value of trees among the people of Nyapfura VIDCO. While there may have been some biases due to the researcher being an outsider, respondents' suspicions about the researcher and the study, and the seasonality of the study, it is felt that the data collected provided a broad reflection of homesite tree planting and maintenance occurring in Nyahunure Ward. Comparison of the research results to similar studies conducted in Zimbabwe validate the findings of this study. While this research was conducted in a small area of Zimbabwe, conditions in Mutoko Communal Area are similar to other communal areas and comparisons can be drawn.

The primary significance of this study is the observation that tree planting programs do not need to be designed specifically for women. Women need not be targeted to the exclusion of men. Instead, as extension officers are in short supply in the area, tree planting programs that include both men and women should maximize the impact of any training programs concerning trees.

One unintended impact of this study was the increased awareness among the residents of Nyahunure Ward regarding the importance of trees. Nyahunure Ward is remote and not subject to frequent visits by researchers or government officials. The appearance of a researcher who was interested in the local activities regarding trees stimulated farmers to think and talk about their personal use of trees as well as overall tree use in the area. Some of the focus groups involved sharing ideas on the need to conserve trees that provide firewood, and the need to learn more about caring for trees.

Implications For Further Study

This study has made discoveries in a number of issues. However, in the process a number of important questions have been raised that warrant further investigation. There are four areas in particular that warrant further research.

1. **Care and Use of Trees.** Inter-household reporting on this subject was not consistent. A more thorough study on these inconsistencies could provide a better understanding of tree valuation by all members of a household, particularly based on gender differences.

2. **Activities Related to Trees.** This study based its findings on reported activities. However, observed activities did not always correspond to what was being said. A longitudinal study that observed and measured tree care and use throughout the year would provide much needed detailed accurate information.

3. **Environmental Degradation.** In a similar vein, a study that investigated farmers perceptions of environmental degradation would be most useful. There were respondents in this study who knew about the environmental and personal benefits of trees, yet felt no need to plant trees.

4. **Tree Nursery Groups.** These were a relatively new development, having been established within the past two years in the research site. In the future, when trees planted in woodlots are mature, it would be interesting to study the impact of tree harvesting on both members and non-members of tree nursery groups. Comparison of these two groups regarding their valuation of trees and the perceived benefits of belonging to a tree nursery group could prove most useful.

Concluding Statement

The purpose of the study was to determine if there were gender based differences in tree planting and maintenance on homesites. The study assumed that gender differences would be reflected by the absence or presence of a male household head. The study has shown that there are differences in the planting, care and use of homesite trees for female-headed households and male-headed households. However, the gender differences were not as great as anticipated.

Overall, looking at the planting and maintenance activities for trees, it can be concluded that trees are valued in Nayahunure. Homesite trees are especially valued, as indicated by the extra care they receive, as well as for the various ways they are used by the household. Therefore, while a blanket approach should not be taken with respect to tree planting programs, neither is it necessary to target women separately from men. It should be enough to ensure that women are included in the programs and that the different approaches between the two types of households are acknowledged and accounted for.

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APPENDIX 1

ABBREVIATIONS AND LOCAL TERMS

ADA - Agricultural Development Authority

AGRITEX - Department of Agricultural and Extension Services, Ministry of Lands, Agriculture and Rural Resettlement

CA - Communal Areas or Lands

CASS - Centre for Applied Social Sciences, University of Zimbabwe

COOPIBO - Belgian NGO

Dambo - Valley bottom land, water discharge area

FAO - Food and Agriculture Organization of the United Nations

FHH - Female Household Head

GMB - Grain Marketing Board

Lobola - Bridewealth payment

IDRC - International Development Research Council of Canada

MHH - Male Household Head

NGO - Non-governmental organization

Shanduko - business

TFP - Tropical Forestry Action Plan

TNG - Tree Nursery Group

UNDP - United Nations Development Program

USAID - United States Agency for International Development

VIDCO - Village Development Committee

APPENDIX 2

VALUE OF TREES SURVEY

#________________

Village 1 2 3 4

Female or Male

in hhld ________

Description ____________________

1. What is your position in this family?
   1 Male household head
   2 Female hhld head - widow
   3 Female hhld head - divorcee
   4 Female hhld head - husband working away
   5 First or only wife
   6 Second wife
   7 Daughter of the owner of the house - single
   8 Daughter of owner of house - married/incomplete lobola
   9 Daughter of the owner of the house - widowed
   10 Daughter of the owner of the house - divorced
   11 Daughter-in-law
   12 Son
   13 Other (specify) ____________________________

2. How old are you?
   1 < 18
   2 18-25
   3 26-45 Or year born ______________
   4 46-65
   5 >65

3. When did you first live here?
   1 Always lived here
   2 1900-1950
   3 1951-1960
   4 1961-1970
   5 1971-1980
   6 1981-1990
   7 1991-present

4. Number of years spent at school

0 1 2 3 4 5 6 7 8 9 >9

5. Are you a: (May be more than one response)

5a Master farmer
5b Farmer representative
5c Member of a farmers group
5d Member of a savings club
5e Member of ADA
5f Member of a TNG

6. Is anyone else in this hhld a member of a TNG?

1 Yes
2 No
3 Don't know

7. Why did you join the TNG?/Why didn't you join the TNG?

____

____

8. Have you personally ever spoken to any extension officers (ADA, FC, Agritex) about any questions you have regarding farming or trees?

1 Yes
2 No
3 Don't know

9. Have you gone to a Farmer's day within the past year?

1 Yes
2 No
3 Don't know

10. Within the last year, have any of your relatives who do not live with you sent money, groceries, or other items on a regular basis?

1 yes
2 no
3 don't know

11. Within the last year, have you personally done any of the following activities to earn extra money? (Circle the appropriate responses)

11a brew beer
11b work as casual labour (ie. pick cotton)
11c work in town
11d sell pots, mats, knitting or other crafts
11e brick making/building
11f sell vegetables
11g other (specify) ______________________

12. How was your field ploughed in the past growing season?
1 using your own draught animals
2 borrowed draught animals
3 rented draught animals
4 other
5 not ploughed
6 don't know

13. How many of the following animals does this hhld presently own?

		#
13a	cattle	______
13b	goats	______
13c	sheep	______
13d	pigs	______
13e	poultry	______

14. Does this hhld own the following implements?
1 plough
2 cultivator
3 sprayer
4 scotch cart
5 wheelbarrow

15. Please tell me the number of acres, or hectares, this household utilizes for the following:

	#ac	#ha
homesite		______
garden(s)		______
field(s)		______
TOTAL		______

16. Do you have enough land to feed your family?
1 Yes
2 No

17. How long does it take you to walk to the nearest water source?

Rainy season ______________ minutes
Dry season ______________ minutes

18. Have you personally ever planted any trees?
1 Yes
2 No

18a. If yes, where did you plant them?
1 homesite
2 garden
3 fields
4 woodlot
5 TNG
6 other, (specify) ____________________

18b. If yes, when did you plant?
1 This year
2 Past 5 years, not including this year
3 6 to 10 years ago
4 10 to 20 years ago
5 More than 20 years ago

19. Has anyone else in this household ever planted any trees?
1 Yes
2 No
3 Don't know

20. Have you planted trees in your homesite which are no longer alive?
1 Yes
2 No

20a. If yes,
Species
____
____
____

Why no longer alive:
1. disease
2. termites
3. drought
4. eaten by animals
5. cut down
6. other

21. Have you ever used any manure, leaf litter, anthill soil for your trees?
1. Yes
2. No
3 Don't know

22. Have you ever bought any of the following items for your trees? (May have more than one response)
22a tree seed
22b tree seedling
22c fertilizer
22d pesticides
22e other chemicals
22f fencing material
22g TNG membership fee

22h Where ____________________
22i Where ____________________

23. Do you think it is important to plant trees around your homesite?
1. yes
2. no
3 don't know

24. Why?

____

____

25. Are there any trees that you should not plant near your house?

Types	Reason

26. If you were given a free tree seedling by the government, what species of seedling would you want to be given? If they didn't have that species available what would your second choice be? Your third choice? Explain why you chose the trees you did.

26a ____________________

26b ____________________

26c ____________________

27. Where would you plant it?
1. homesite
2. field
3. garden
4. woodlot
5. other
6. wouldn't plant
7. don't know

28. Why would you plant it there?

____

____

29. If you were to plant a tree today, who would the tree belong to when you died?

____

30. Look around you. Compared to when you were first living here are there:
1. more trees and shrubs
2. fewer trees and shrubs
3. same number of trees and shrubs
4. don't know

31. Does it take you more, less, or the same amount of time to collect firewood than when you first came here?
1 more
2 less
3 same
4 don't know

32. If more, or less, why?

____

____

******

HOMESITE
Fill in CHART 1 for each planted tree in the homesite

34. Tree species

34a Please tell me the origins of this tree. Did you:
1 plant a seed where this tree is now
2 planted seed and then transplant the seedling
3 take a wild seedling and transplant it here
4 buy the seedling
5 given the seedling
6 branch planted
7 other ____________________

34b When was it planted? (month and year)

34c Who decided to plant the tree?
Female
Male
Both
Child

34d Who actually planted the tree?
F M B C

34e Has this tree been watered since it's been planted? By who?
F M B C Not watered

34f Has the area around this tree been weeded? By who?
F M B C Not weeded

34g Is/Was there a fence around this tree? Who built it?
F M B C No fence

34h Have you personally used this tree for any of the following purposes within the past year?

1 firewood
2 fruit
3 poles for house/kraal/fence
4 planks
5 fodder
6 medicines
7 wood for hhld implements
8 wood for farming implements

34i Have you personally used this tree to provided any of the following items which have been sold?

1 firewood
2 fruit
3 poles for house/kraal/fence
4 planks
5 fodder
6 medicines
7 wood for hhld implements
8 wood for farming implements
9 shade
10 flowers
11 fence or laundry post

34j Who gives you the authority to use this tree?
F M B No one

34k Who decides when to sell or cut?
F M B N/A

34l Who decides where to sell?
F M N N/A

34m Who actually sells or cuts
F M N N/A

34n Who gets the money?
F M N N/A

CHART 1 TREE MAINTENANCE

Tree Species	#	Origin	mth/yr	Decide	Plant	H20	Weed	Fence

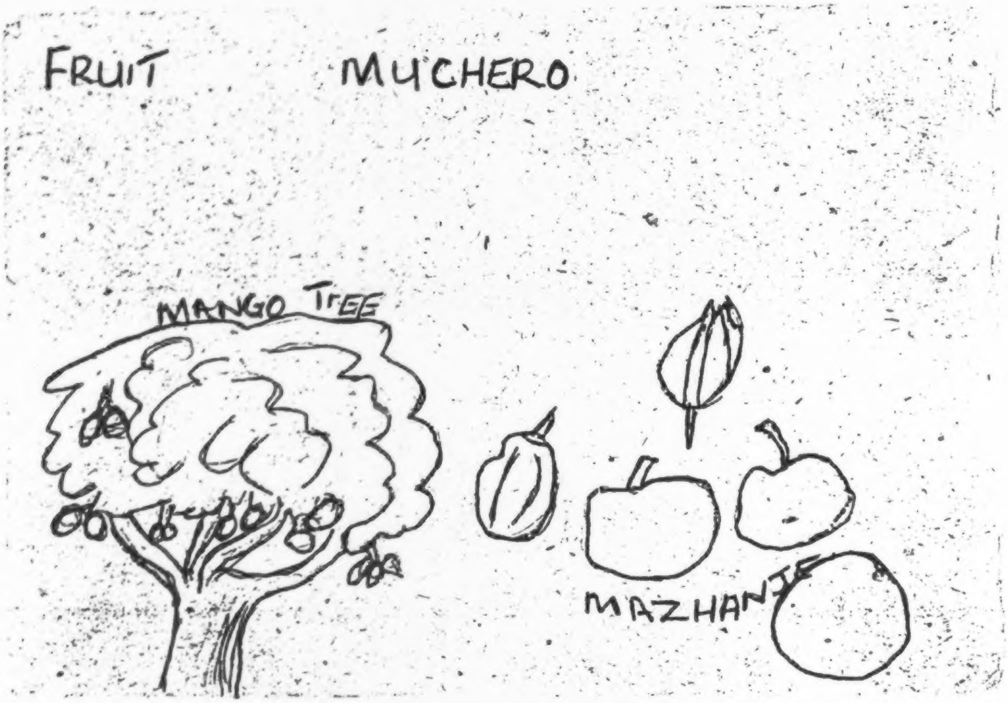
CHART 2 TREE USE AND SALES

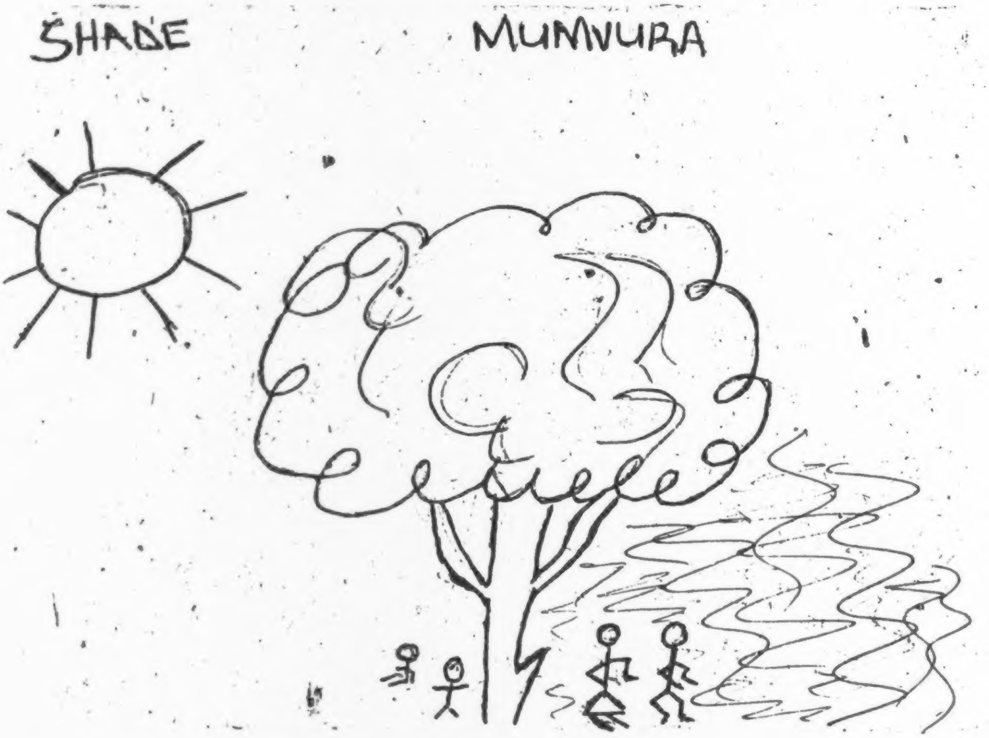
Tree Species	Per Use	Per Sold	Auth	When	Where	Who sells	Who$

RANKING OF USES (Most to least important)

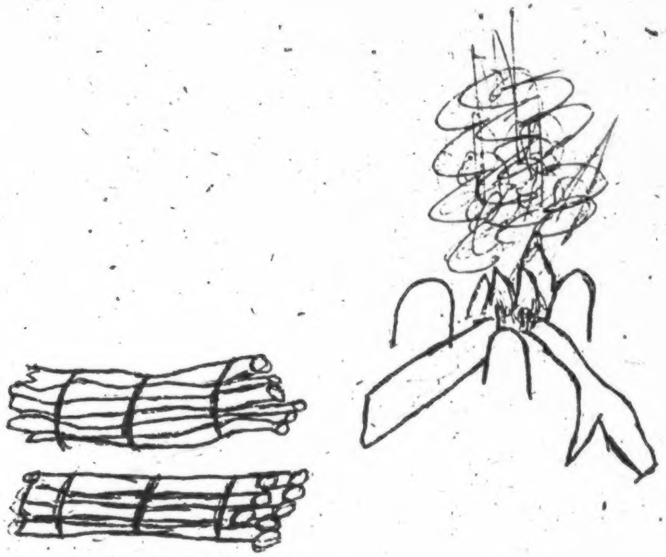
1. ______________________
2. ______________________
3. ______________________
4. ______________________
5.
6. ______________________
7. ______________________
8. ______________________
9. ______________________
10.

APPENDIX 3

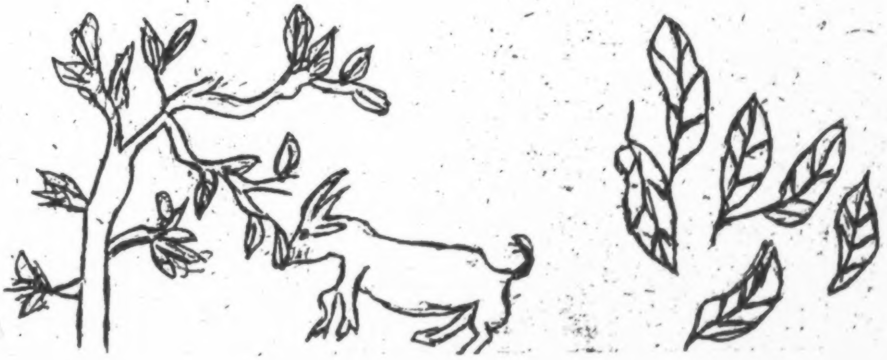

FRUIT
MUCHERO
MANGO TrEE
MAZHANJE


SHADE
MUMVURA

FIREWOOD HUNI



FODDER ~~AAA~~ CHIKAFU CHEMASHIZHA



APPENDIX 4

TREE SPECIES FOUND PLANTED AT HOMESITES

EXOTIC:

FRUIT:
Mango
Papaw *
Orange
Lemon
Apple
Peach
Naches
Guava
Mulberry
Granadilla *
Avocado

FLOWERING:
Bougainvillaea *
Clematis *
Other

WOOD/OTHER:
Gum
Jacaranda
Pine
Cypress
Palm

INDIGENOUS:

MAIN:
Muhange
Mutowa
Muchobve
Mutosi
Musomo
Mujirimoni

OTHER:
Mono
Mumbumbu
Chiwirowiro
Musawa
Mungongoma
Mupepe
Mutiti
Muhacha
Mususu
Mutohwe
Mutunduru
Mutedza
Baobab
Mungoza
Acadia

* Technically not considered a tree although reported as such